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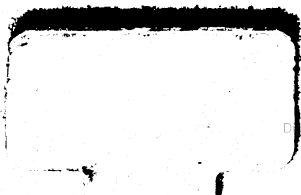
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THE RECORDING ANGEL
FROM THE
MOSAIC IN ST. PAUL'S CATHEDRAL.
Designed by Sir W. B. Richmond, R.A.

Photo by]

[F. Hollyer.

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THE ROMANCE OF GLASS-MAKING

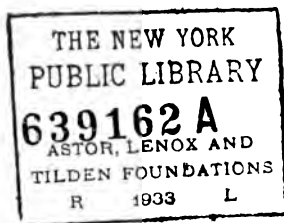
A Sketch of the History of
Ornamental Glass

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WALTER GANDY

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1898.



NOTE.

THIS little book has been designed to supply such information concerning the history of Ornamental Glass as is likely to be useful to general readers. It does not profess to be exhaustive, and a description of the details of manufacture hardly came within its scope. Those who are interested in the subject are referred to the chapter on Glass in a companion volume to this, entitled "Chemists and their Wonders."

Wherever possible, reference has been made to objects that may be seen in one or other of our public museums.

NEW YORK
JAN
1934



CHALICES AND TAZZA, AFTER OLD EXAMPLES OF MURANO GLASS.

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THE ROMANCE OF GLASS-MAKING.

CHAPTER I.

GLASS IN LEGEND AND FANCY.

THE suggestion has been gravely made by one of our most learned and enthusiastic historians of art that the making of glass originated in Fairyland. And in view of the fact that no certain origin can be given to this fascinating craft, we may be allowed to assume that magic had more to do with it than is generally admitted. No one now believes Pliny's story of the discovery of glass by some Phœnician mariners as they cooked their meat upon the sea-shore. The cold light of science has proved that glass would not have been formed under such conditions, and it is clear from the researches of explorers that glass was known to the Egyptians long before the Phœnicians were a distinct people.

Whence did the Egyptians derive their knowledge? Matter-of-fact historians are still attempting to solve that problem, but if we might believe Arab traditions, the fallen angels of fire, the "Jinn," were probably the

introducers of this and other wonderful arts. To them was attributed the building of the Pyramids, and one knows what treasures of gold and silver and all manner of precious stones were still available to them in the days of the "Thousand and One Nights." We open a copy of that storehouse of Moslem fancy, and on the very first page may read of the sad genie of prodigious stature, bearing on his head a great glass box, shut with four locks of fine steel, and of how he unlocks it with his four keys, and there steps out a lady magnificently apparelled and of great beauty.

From the floating tangle of fairy superstitions, in which our forefathers were content to clothe their conceptions of supernatural happenings, here and there a tangible thread can be drawn out. In many places there are legends of magical cups snatched from the fairies at the risk of life. Of such a nature is the goblet of glass still preserved by the family of Musgrave of Edenhall, in Cumberland, and known as the "Luck of Edenhall." The story goes that a group of fairies dancing round St. Cuthbert's Well were surprised by a servant, and, fleeing precipitately, left this cup behind. Perceiving their loss, one of them returned to claim it, but finding it held fast in the intruder's hand, called out as she flew away :

" If that glass should break or fall,
Farewell the luck of Edenhall."

This singular treasure is very jealously guarded, and, so far, has suffered no injury, although in Uhland's ballad—familiar to us in Longfellow's translation—it is, for poetic purposes, described as broken, and the "Luck" vanished. The cup is of clear glass,

painted with arabesques in enamel colours, and suggests a Venetian, or possibly Moslem, origin. It has been enclosed in a stamped leathern case ever since the fifteenth century.

“A fair Venetian glass of excellence,
In frail material—geometric lines
Border a space where foliage intertwines,
Bright tracery of saffron and of red
In flowery azure pattern on a pale sea bed.”

Upon the leathern case are the initials I. H. C., and these have suggested that the cup at one time had been used for sacred purposes. In this there is nothing improbable. Crusaders returning from the East often brought back with them treasures of Saracenic art, and the cup may easily have come into the keeping of some hermit dwelling near the holy well.

Chalices of glass were objects of mystical wonder in the early days of romantic chivalry, and round the most famous of all—the “Holy Grail”—have gathered very strange and beautiful legends, which we may puzzle over in Sir Thomas Malory’s romance, or read in easier verse in Tennyson’s “Idylls of the King.” In Richard Wagner’s music-drama of “Parsifal,” the main interest centres round the Grail and its guardians in the Castle of Monsalvat, that “Castle in Spain” which no man now may find, seek he ever so earnestly, though he may see at Genoa a very ancient vessel of glass—Byzantine or older still—which for centuries has been known as *il Sacro Catino*: the sacred dish.

When we come to study Egyptian glass we shall see in how many respects we are indebted to the civilisation of ancient Egypt for our arts and sciences.

In the matter of folk-lore, too—a subject of hardly less interest to the historian than more tangible records of forgotten peoples—several of our most engaging fairy tales can be traced back to Egyptian sources. And conspicuous among them is that story of perennial interest, “Cinderella and her Glass Slippers.” It is true that in the Egyptian version the slippers are not of glass, and it is an eagle that steals one of the dainty jewelled shoes of the Princess Rhodope while she is bathing, and it is King Psammetichus (B.C. 670—the date is very exactly given) who, when the shoe falls from the sky into his lap, desires to see the unknown owner of so fair a thing. When Perrault came to write his French version of the antique story, the scene is laid in quite humble life, and the learned are to this day uncertain whether he should have described the slippers as of “verre” or “vair.” But does it matter whether they were of glass or squirrel-fur? Glass is more magical and impossible; therefore glass it shall be. Possibly the fairy godmother looked into futurity, and foresaw that glass-weaving would be an accomplished fact in the nineteenth century. Fabrics are now made of spun glass, and an enterprising Venetian manufacturer is said to turn out bonnets by the thousand trimmed with glass cloth, which never wears out, and cannot be affected by the worst of atmospheric conditions. As to whether, considering the fickleness of fashion, ladies would like the idea of a bonnet lasting for ever—that is more than can be stated with certainty. The Infanta Eulalie of Spain, on her recent trip to America, received a novel present from the Libbey Glass Company of Toledo, Ohio. It was a gown of glass and silk woven together. The silvery sheen

produced by the combination is said to be remarkably pretty, especially under the rays of artificial light.

A house of glass is now quite within the range of possibility. We, long ago, had glass bricks, and tiles, and floors. Now we may have table-cloths, napkins, and window-curtains of glass, which only require a hard brush with soap and water to renew their freshness. A further novelty is porous glass to be used for window-panes; it is full of tiny holes, too fine to cause a draught, but sufficiently large to ventilate a room. Of the great palace of glass, in which the first International Exhibition of 1851 was held, and which was afterwards reconstructed at Sydenham, the story has often been told. It was the first time that glass and iron had been used on such a large scale, and was undoubtedly a daring thing to do. All the world was astonished by the fairy palace that rose so quickly above the lawns of Hyde Park, enclosing within its transparent walls the tallest of the park trees. The happy thought, first sketched out hastily upon a sheet of blotting paper, brought a knighthood to Joseph Paxton, once a working gardener.

The idea of rendering glass less brittle has ever since antiquity haunted the minds of those unsatisfied mortals we name inventors. So serious is this brittleness, especially with the enormous sheets of plate-glass now used, which appear to deprive the upper floors of our buildings of all support, that Plate Glass Insurance Companies are called into existence. There is a story that when, some time in the fifteenth century, the Emperor Frederick IV. of Germany came to Venice, the Doge and Senate proudly presented him with a vase of glass as the most worthy treasure they

could find. He, however, let it fall, and then remarked that glass was very beautiful, especially in the example they had kindly presented to him, but it was in one respect inferior to silver or gold—it was very fragile. The hint was too plain to be ignored; a vase of precious metal was brought forward.

An inventor in the days of the Roman emperor Tiberius claimed to have found a process for rendering glass malleable. The story has been thus told:

“There was once an artist made glass vessels of such firmness that you would no more break them than gold or silver. This person, having made a cup of the finest crystal, and such an one as he thought worthy none but Cæsar, got admission with his present. The beauty of the gift and the hand of the workman were highly commended, and the zeal of the donor kindly received. When the man, that he might change the admiration of the court into astonishment and ingratiate himself still more in the favour of the emperor, begged the cup out of Cæsar’s hand and dashed it against the pavement with such vehemence that the most solid and constant metal could not escape unhurt, Cæsar was both surprised and troubled at the action; but the other, snatching the cup from the ground, which was not broke but only a little bulged as if the substance of metal had assumed the likeness of glass, drew a hammer out of his bosom and very dexterously beat out the bruise, as if he had been hammering a brass kettle. And now the fellow was wrapped in the third heaven, having, as he imagined, got the friendship of Cæsar and the admiration of all the world; but it happened quite contrary to his expectation, for Cæsar, asking him if anyone knew how to make glass malleable besides

himself, and he answering in the negative, the emperor commanded his head to be struck off, for, said he, if this art be once propagated, gold and silver will be of no more value than dirt."

That which this unhappy artist is said to have achieved has been to some extent accomplished this century by M. de la Bastie, who discovered a process for hardening glass by immersing it whilst still hot in a bath of melted fat. It seems to be difficult of application to any but simple shapes, and when used for window-glass prevents its being cut with a diamond. Similar results are said to be obtained by the action of super-heated steam upon the plastic glass.

The cooling of glass presents very curious phenomena. Unless it has been very gradual throughout, and this is generally obtained by passing the objects slowly through an annealing oven, the glass is found to have cooled unequally and to be liable to fracture owing to the state of tension set up between its particles. The glassmakers amuse visitors by making what are known as Prince Rupert's Drops, in which this peculiarity is very apparent. They drop a small quantity of glass into water, and on taking it out, it has assumed a sort of tadpole shape, with a long thin tail. The wide end of the drop will resist a heavy blow, and you can hardly mark it with a file or diamond. But so much as touch the tail or cut through its skin with acid, and the whole thing explodes. The gossiping Mr. Pepys records how "Mr. Peter did show us the experiment of the chymicall glasses, which break all to dust by breaking off a little small end, which is a great mystery to me."

Hudibras' epigram will be recalled :—

"Honour is like that glassy bubble
That finds philosophers such trouble ;
Whose least part cracked, the whole doth fly,
And wits are cracked to find out why."

The same disposition to fly to pieces will be noticed in the suddenly cooled "Bologna Phials." They will withstand pressure or blows on the outside, but if a grain of sharp sand be dropped inside the charm is broken, and the glass falls to pieces. Strangely enough, this unannealed glass, if re-heated and then allowed to cool gradually, will have lost this treacherous quality and will break with the clean fracture of ordinary glass.



HOURL GLASS, ST. ALBANS.

Here and there in our old churches there still survives an hour-glass in its ornamental frame. The last to be seen in the city of London was at St. Albans, Wood Street. During the sixteenth and seventeenth centuries, every church had its glass placed on or near to the pulpit to warn the preacher of the flight of time. The appetite for long sermons was prodigious. It is said that Bishop Burnet, preaching once in St. Margaret's, Westminster, before the House of Commons, having arrived at the end of his time, turned the hour-glass in order to show that he meant to continue, and was at once interrupted by the

gratified murmurs of the congregation. The use of the sand-glass as a symbol of the passing of time can be traced back to Egypt. A half-minute glass is used on board ship while casting the log. The glasses used by Columbus for a similar purpose were timed for half-an-hour. Charlemagne is said to have had a monster sand-glass which required turning but once in twelve hours. In South Kensington Museum there is a set of four large sand-glasses in an ornamental frame of German work of the sixteenth century.

From the earliest ages, as we shall see, the eye of mankind has been attracted by the effect of the colours that certain minerals will give when fused with glass. In this art the Egyptians were proficient at an early date, and were imitating gems and precious stones with success. Of the wonderful glow of colour now possible in our windows they perchance had little idea. Window-glazing is of northern growth, and it was reserved for the Gothic artist to fully develop the glorious possibilities of the coloured window. Milton could not resist the charm, as the often-quoted lines in "Il Penseroso" will show :—

"But let my due feet never fail
To walk the studious cloister's pale,
And love the high embow'd roof,
With antic pillars massy proof,
And storied windows richly dight,
Casting a dim religious light."

Keats in his "Eve of St. Agnes" is quick to express with fine extravagance the poetry of the window :—

"A casement high and triple-arch'd there was,
All garlanded with carven imageries
Of fruit and flowers and bunches of knot-grass,
And diamonded with panes of quaint device,

Innumerable of stains and splendid dyes,
As are the tiger-moth's deep-damasked wings ;
And in the midst, 'mong thousand heraldries,
And twilight saints, and dim emblazonings,
A shielded scutcheon blush'd with blood of queens and kings."

That such a fragile material as glass should still be found in many an ancient church, where so many changes of taste and chances of fortune have left their traces, adds an almost pathetic interest to the few examples that remain ; and if one felt inclined to moralise, there is in this subject every scope for such an unhealthy habit. In the study of any artistic handicraft, there is no better opportunity of seizing its spirit and feeling than when we can see it *in situ*, in the very place for which it was designed. And this is especially the case with window-glass. The impressive effect of such a glorious shrine as the Abbey of St. Ouen in Normandy, for example, is due almost entirely to its magnificent glass, of a date contemporary with the building. If one wants to count the windows, the guide will tell you there are one hundred and twenty-five, not including the three "rose" windows ; and of one of these last he will tell a moving tale. The window is known as the "Apprentice's Window," and is in the north transept. The master-mason, Alexander Berneval, who had entrusted his pupil with the design of it, was so jealous of the youth that he slew him. Although apprentices could then be treated with a certain amount of rigour, this was too much, and Berneval was tried and executed for the murder ; but the monks, in consideration of his great services to the Church, buried him in consecrated ground, and there, in one of the chapels, master and pupil lie side by side.

CHAPTER II.

EGYPTIAN AND PHŒNICIAN GLASS.

"THERE is no new thing under the sun," wrote the Preacher long ago. The disillusioned monarch was thinking of far more serious issues than would have been suggested by the little brightly-coloured vases from the coasts of Tyre and Sidon that must have been familiar to his sight. For were not many and many of his queens brought from Phœnicia, the fabled land of glass-workers? and their scents and spices, their unguents and toilet-dyes, were they not stored in dainty glass vases of the gayest hues?

But the Phœnicians did not invent glass-making, although since Pliny's account of their accidental discovery of glass upon the shore under Mount Carmel, it had been the world's story that those wonderful old travellers and merchants were the first glass-makers.

And if we take in our hands a child's glass taw, and see how, embedded in the clear glass, there are pretty spiral lines of coloured work, we say naturally that the idea comes from Venice, where, during the Middle Ages, there were most important factories of ornamental glass. But the Venetian craftsmen were by no means the first to use these methods of com-

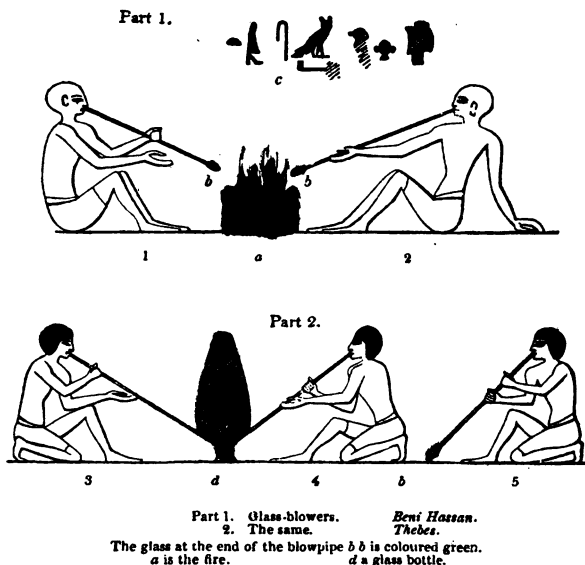
binning in one mass strands of different coloured glass; the Romans had long before been most expert workers, and wherever the sites of Roman dwellings are unearthed, and the earth carefully sifted, fragments, more or less perfect, of the Roman coloured glass, are sure to be found.

Nor were the Romans the inventors. Centuries before Rome was a city the workmen of ancient Egypt were fabricating the most precious little objects in glass of various colours, and every fresh antiquarian find in that land of mysteries and marvels reveals some new evidence of the extreme antiquity of the Egyptian knowledge of the art.

Mosaics, in patterns formed by pieces of glass or glazed material, are looked upon at the present day as somewhat of a novelty, and the builder who should now line the walls of his vestibule with glass tiles counts himself enterprising—nay, almost too adventurous. "There is no new thing under the sun," however. The same idea occurred to the builders of ancient Egypt, even as early in its long history as the sixth dynasty, and at the British Museum we may see some small glazed tiles of a green colour that were formerly part of a doorway into one of the pyramids at Sakkarah. Nearly 6000 years ago those little bits of colour were made and fastened up in their places to remain there through all the changes of empire, until loosened in these later years and brought home by our archæologists.

Six thousand years takes us a long way back into history, and yet it would seem certain that glass-making was not a new thing then. On monuments of the fourth dynasty (which, according to the latest historians, lasted from B.C. 3998 to B.C. 3721) glass

bottles containing red wine are represented, and it is highly improbable that the discovery of *glass-blowing* was at that time very recent. No actual specimens of this earliest work are so far known, but in a tomb of the fifth dynasty at Sakkarah, glass-blowing is represented along with other trades. A better known instance is the painting at Beni Hasan, dating from



EGYPTIAN GLASS-BLOWERS.

the reign of Usertesen I. (2758–2714 B.C.). Here the glass-blowers are shown at work, seated in a somewhat awkward manner before a brazier. Each has a bulb of glass (coloured green) on the end of his blowpipe, and the glass is evidently being kept hot by its proximity to the fire. In another representation at Thebes two men appear to be forming a bottle

between them—unless, indeed, the object, which looks like an inverted vase as tall as themselves, should really be intended for the furnace. Behind them is a third workman engaged with his single pipe and bulb of glass.

The oldest extant specimens of glass are, as will be seen, Egyptian. It is not yet, however, certain that the Egyptian civilisation, ancient though its monuments prove it to have been, was the first to emerge from the mists of the earliest ages, and many eminent scholars are prepared to assert that in the plains of Chaldea and along the shores of the Persian Gulf we must seek for the beginnings of history and the first advances beyond the pastoral infancy of man. At a very early date, before the pyramids were built in Egypt, there was evidently communication by sea between Chaldea, Punt (or Arabia Felix), Egypt, and Sinai. The early kings of Chaldea obtained their wood from the valley of the Nile, and used the hard stone from the peninsula of Sinai for their statues, and Egyptian legends make the gods Hathor and Ra come from Punt, the "land of the gods." Some sculptures of a prehistoric era, found by Professor Petrie at Koptos, and representing, although very rudely, one of the early kings of This, named Min, have some surface carvings of shells, saw-fish, ostrich, and elephant. These would serve to prove that the race came from the vicinity of the Red Sea. Koptos itself, a city of very ancient foundation, is at the Nile end of one of the oldest trade routes in the world, and one by which caravans still travel to the port of Kosseir on the Red Sea.

Whatever the origin of the Egyptian civilisation may have been, that it was singularly forward and

complete even in the days of monarchs of the earliest mythical dynasties must be quite certain. Many centuries of growing knowledge must have elapsed before the fourth dynasty appeared on the scene. Geometry and astronomy were by that time already known; the decimal system of numbers and the division of the year into twelve months and 365 days were in use; of chemistry there must have been some idea; medicine and anatomy were familiar. Architecture revelled in gigantic tasks; the great pyramid of Khufu (or Cheops) employed 100,000 men in the building, and contains more stone than any other single erection in the world, stone that was all brought from the opposite bank of the Nile, and squared, levelled and fitted with an accuracy that it would be difficult to imitate at the present day, even with the aid of our perfect instruments. The sculptors possessed a skill of characterisation that render their works of the greatest possible interest, and that was not improved upon during all the long ages that followed. In the gentler arts, music already employed the harp, flute, and the peculiarly national instrument, the sistrum. The blow-pipe, saw, adze, chisel, balance, lever, plough, potter's wheel and kiln were all in use, and, as we have already seen, glass and glazed pottery.

With the name of Menes, the first king of the first dynasty, all the ancient chronological lists begin. He is on the borderland between myth and actuality. He is said to have removed the seat of government from This, to have marched northward down the valley of the Nile, and to have founded Memphis and the temple of Ptah (one of the numerous names under which the sun was worshipped). The date assigned

for his reign is about 4750 B.C. No monuments of his erection now exist, although the embanked course of the Nile near his city of Memphis is said to be due to his engineering. Among the ruins of the city were found two beads of *blue glass* attached to a gold necklace stamped with the name of Menes.

The beautiful turquoise glass of which these beads are made is therefore probably the oldest in the world. Blue seems to have been at all times the favourite colour of the Egyptians. Sneferu, the first king of the fourth dynasty (B.C. 3998), is known to have conquered the peninsula of Sinai with its valuable mines of copper and turquoise. The Egyptians were from quite early times able to imitate in glass the colours of turquoise, lapis-lazuli and other precious stones. The blue glass was used both to form solid ornaments and decorative objects, and also in the form of a glaze or coating for objects made in other substances. Such was—and this principally—the siliceous pottery known generally as Egyptian porcelain of which thousands of specimens exist in our collections. Shelf after shelf, and case after case, in the British Museum is full of this blue glazed ware, and very bright and effective the colour is. There are some bangles lying with the relics of Queen Hatshepsut (B.C. 1600), that present the purest and most vivid of blue tints. And hardly less interesting in the same case, is a portion of a draught-board with alternate squares of ivory and blue glazed ware and one of the draughtsmen, the sole victor in the last game ever fought on that board—a little cone of clear blue glass of just the shape familiar to us as a “muller” for grinding artists’ colours. The Egyptian artists were sufficiently acquainted with the capa-

bilities of this glazing to be able to coat vases and scarabs of steatite with it. There is for instance in the British Museum such a vase inscribed with the name of Thothmes I. (B.C. 1516), while near it is a large steatite scarab glazed in green that was taken from the mummy of Thothmes III. (B.C. 1449) and has upon it a representation of the king kneeling in adoration and holding in his right hand the whip emblematic of sovereignty; behind the king is the inscription: "Triumphant before the gods." Bearing the name of the same Thothmes III. we see a pretty little jug about three and a-half inches high, of a light greenish blue glass; it has decorations upon it very freely drawn in what appear to be enamel colours or glasses. Part of this decoration apparently consists of a skeleton feather, but the learned declare that this is a "sacred tree," a symbolic ornament that was largely used in Phœnician and Assyrian ornament. It is drawn in yellow, and there are bands of yellow on the mouth and foot of the jug, and lines of yellow, white and black (or dark blue), on the little handle. This is a very interesting relic of the early days of glass decoration.

A little ornament in the Slade collection at the British Museum is far older than this vase of Thothmes III. It is in the form of a lion's (or panther's) head, not much more than half-an-inch across. The colour is now a nondescript dark olive green, but the substance was originally an opaque blue glass. On the flattened underside of the charm are hieroglyphics with the name of Antef of the eleventh dynasty (about B.C. 2850). This monarch's tomb is at Thebes, in Upper Egypt, and it was here that this glass relic was discovered.

Considerably older than the last is a cylinder of clear glass about three inches high, inscribed with the name of Pepy II. of the sixth dynasty (about 3443 to 3348 B.C.).

Of the relics of this monarch's long reign which began when he was six years old one very curious inscription may be mentioned, although, it is true, it has no particular connection with the subject of glass. On the front of a tomb in the cliffs at Aswan, in Upper Egypt, are carved records of an official named Herkhuf. Various expeditions are mentioned, with the amount of tribute acquired in incense, ebony, skins, elephant's teeth, and so on. These had taken place under the king Merenra, Pepy's brother. Then comes a letter from little king Pepy himself, and dated in his second year, expressing his delight that Herkhuf was returning from an expedition in peace, with all his soldiers, and with good tribute, and with a wonderful dancer named Deng, from the Land of Spirits (*i.e.* Punt)—possibly a religious dancer. And his little majesty orders that when the Deng travels, attendants shall watch him that he fall not in the water, and shall keep him in sight during sleep that he run not away, for his majesty loves to see this Deng more than all other tribute. If he is brought home safe and sound, his captor Herkhuf shall be most highly honoured, and all provisions and necessities will be supplied him while on his way to the court. And the grave captain has his little king's letter carved there in stone.* That was more than 5000 years ago.

Those ancient Egyptians were fond of simple

* Flinders Petrie, "History of Egypt," vol. i.

pleasures. It is almost pathetic to look at the cases of toys at the British Museum, for most of these little things have been found in tombs or among the wrappings of the mummied remains of the dead. Space does not avail to deal at length with the funeral customs of the Egyptians, but we must allude to the strong belief in the immortality of the soul, and of its ultimate return to reinhabit the body. This belief led to the adoption of elaborate methods of embalming, and to the placing with the dead body of foods, toilet materials, articles of furniture or personal decoration, toys—anything and everything connected with its former life. With the rich, the mummy wrappings and coffin cases were choicely decorated, the sarcophagus—often a huge hollowed block of granite—covered with carved figures, and the walls of the tomb or mortuary chamber decorated with paintings of scenes in the life of the occupant. That these should not be disturbed, the chamber was often hidden and built up very carefully, so that discovery should be impossible. For the highest in the land, great pyramid mounds of brick and stone were piled over the sepulchres, and the passages by which the mourners retired were closed by great portcullises of stone. Long ago, however, many of these secret places were rifled. Tunnels into the pyramids laboriously driven by our modern explorers would often reveal that the secret had been solved centuries before, and that everything of value had perhaps been removed. In some cases, later monarchs have been found to have mutilated the records of their predecessors, and appropriated their belongings, often placing fresh inscriptions across the older ones.

Among the miscellaneous wreckage from these

tombs, the toys and beads should be noticed. We can here do little more than allude to those in which glass is used. The beads are of the greatest possible interest; many of them are of the opaque mixed glasses worked in patterns, the colours of which go entirely through the object as in the Phœnician and Roman glass of much later periods. Many of the beads are of large size; others again are so tiny as to be strung on threads to make a mop of hair for a doll's head. The dolls are grotesque; a favourite shape is a flat board suggesting a battledore or a large bowlless spoon; generally the legs are non-existent. One amusing little model (in the British Museum) is of a cat with glass eyes, and a moveable lower jaw which could be made to wag up and down in a ferocious manner by pulling a string passed through the top of the head.

Other beads are in transparent glass, and these are often combined with ornaments carved in precious stones, such as carnelians, amethysts, and garnets. At South Kensington Museum is a portion of a mummy wrapping in bead work in the shape of a sacred beetle or scarab; the beads are small and closely strung together in the fashion of the bead-mats worked by our grandmothers.

Then there are some absurdly ugly little masks in moulded glass—these are almost Japanese in feeling, and with those, to be seen at the British Museum, is a larger one, about two inches high, of rather later date. This used to be in the Castellani collection, and is quite charmingly grotesque. It has a white face, a very prominent nose, big discs for its eyes, and the curls on its forehead and the curled beard are iridescent through age.

Some of the shapes made in glass for inlaying in wood are of the greatest beauty and finish of workmanship. The coffins and mummy cases painted with portraits were often finished with inlaid faces, hands, feet, wigs, beards, and other details in glass. There is at the British Museum, among numerous similar specimens, a little hand, not more than one inch in length, from Tell-el-Amarna ; it is of blue glass and, notwithstanding its small scale, most delicately modelled. Near it is a fragment of wooden framing about ten inches square, which shows how these glass details were introduced. It probably formed part of a sepulchral tablet, and represents one seated and two standing figures. All the parts of the design intended for flesh had been inlaid with glass, but most of this has disappeared, leaving the channel empty into which it had been inserted ; the female figure on the left, now headless, still has dainty blue hands and feet, and short detached lengths of a lotus sceptre. Pectoral tablets were also frequently used, and these are often inlaid with glass. The colour effect of these little jewelled ornaments is, in some cases, surprisingly fine. The colour of one of the large scarabs, bearing the name of Sheshonk III. (of the 22nd dynasty), is worth gloating over ; the blue seems to glisten like the blue of heaven.

Of personal ornaments worn by the Egyptians, the examples are not so numerous or so important. The necklaces especially are modest in size and materials. Many at the British Museum are of glass, or of glass mingled with carved stones, but all on a tiny scale, the little beads or moulded ornaments being almost too small to see. A few finger rings in blue, brown, and white glass have been found—plain hoop rings

without ornament. On the other hand, ornaments of greater cost were worn. Some of the work in gold shows great skill on the part of the old workers. The British Museum has a gold ring with an inset bezel of glass, in which is inlaid a human-headed hawk. This is considered to be one of the finest pieces of glass-work in the Egyptian collection.

The famous jewellery of Queen Aah-hotep (dating about 1500 B.C.) contains some glass-work, in the form of inlays of glass enamels. One of the relics is a small diadem of gold of peculiar form, bearing upon its circlet two sphinxes, and between them a sort of box. There seems to be a want of connection between these features and their support, and the design is to this extent not wholly pleasing, but the workmanship is admitted to be admirable. On the lid of the box is the name in hieroglyphics of King Aahmes, "the Son of the Sun, Aahmes, living for ever and ever," inscribed in gold on a ground of lapis-lazuli. The sides of the box—it is oval in form—are covered with a small chequer ornament formed of red and blue glass triangles set in gold. A similar decoration beautified the handle of a dagger, this portion being otherwise, of carved cedar wood overlaid with gold; the blade is of solid gold, and down either side of it is a narrow band of hieroglyphics and ornament inlaid in bright blue. Among these again occur the name and titles of Aahmes, while a lion chasing a bull and four locusts or grasshoppers allude to the king's prowess and achievements.

These valuable objects formed part of one of the most interesting "finds" in modern exploration. In the valley of the tombs of the Kings, near Thebes, is a vast necropolis that has been for centuries past

a hunting-ground for the spoiler, and many are the burial places that have been rudely entered and desecrated. Fragments of mummy-cases lie around to witness to the rough and ready way of disposing of what could not conveniently be carried off by thieves. Exploration in Egypt has not always been conducted with the care and knowledge that are now devoted to the task, and when in the spring of 1859, at a depth of several feet, a remarkably large mummy-case was found, it was not anticipated that anything very wonderful would be revealed. It was evident that the coffin was not originally deposited there, for the elaborate decorations and gilding were in immediate contact with the surrounding soil. It is conjectured that, thousands of years ago, the custodians of the royal tomb, no doubt fearing it would be entered and rifled during the warlike times that followed the queen's death, had secretly removed the coffin, placed within it a miscellaneous collection of valuables, some being taken from the coffin of her son, Kames, and had buried the whole again in an unmarked spot.

For when, at last, under the watchful eyes of M. Mariette, the eminent archæologist, who was superintending the explorations at that time, the huge coffin was opened, a unique treasure was disclosed. Within there lay the mummy of a famous queen, and in the wrappings of linen that surrounded her remains were found all kinds of objects of gold and silver; among them were the diadem and poniard we have already described. Other objects besides these bore the name of Aahmes, such as a gold axe, a scarab, and three bracelets, while a gold model of a galley mounted on wheels bore the name of Kames. The collection is now one

of the attractions of the Egyptian Museum at Ghizeh, and is extremely interesting as throwing light upon the history of the great war of independence, by which the rule of the Shepherd or Hyksos kings was broken down after more than 500 years of usurpation. Josephus identified the Hyksos dynasties as Jews, and patriotically enlarges upon such details of their story as were known to him. But it is now proved that he was mistaken, and that the story of the Jews in Egypt does not correspond in time with the rule of the Hyksos. Queen Aah-hotep lived a long life. Her husband, Sekenenra, the tributary prince of the Southern kingdom, had refused to pay tribute to the bullying Hyksos king, and the war of liberation began. Sekenenra was killed in battle, and brought home to Thebes to be buried. He was succeeded by Kames, he by Sekhentnebra, and he by Aahmes, all three being sons of the queen by a first husband. Aahmes (the Amasis of the Greeks) succeeded in driving the Hyksos northward, capturing their strongholds, and, after a few final flickers of insurrection, entirely expelling them from Egypt. Hence the meaning of the lion chasing the bull depicted on the poniard found with the remains of his mother—he was “The Lion among the Shepherds.” And the four locusts typified the irresistible way in which he marched over and devastated the enemy’s country. The queen lived on twenty years or more after the death of Aahmes, and saw her grandson, Amen-hotep, and great-grandson, Thothmes I., come to the throne and win great honour and wealth in foreign conquests. But the weapons and ornaments inscribed with her son’s name were evidently her greatest treasures, and they were buried with her.

We have occupied almost too much space in thus mentioning the historic significance of these relics of ancient Egyptian art. But if we can here and there discern the human feeling underlying the art, and the human associations connected with these fragments of past history so strangely preserved through thousands of years, our studies will be, doubtless, more attractive than if we merely catalogue the objects on our museum shelves.

And who were the artists who thus excelled in their craft so long ago? For the most part they are nameless. We may imagine the little workshop with its clay-built walls and charcoal furnace; the few and simple tools, the few lumps of vitreous pastes compounded and coloured in accordance with a jealously guarded recipe originally emanating from the wise priests of the ancient worship, and we can try to realise the quiet delight with which the delicately-wrought ornaments were slowly brought to completion. Strange to say, there is a record of a master-artist named Mertisen, who, during the reign of Mentuhotep III. (about 2800 B.C.), carved his story in stone. He thus describes his skill. "I know," he says, "the mystery of the Divine Word, an artist skilled in his art. I know what belongs to it; the sinking waters, the weighings done for the reckoning of accounts, how to produce the forms of going forth and returning, so that the limb may go to its place. I know the walking of the image of man, the carriage of a woman, the two arms of Horus, the twelve circles of the injurious (the hours during the night), the contemplating the eye without an equal which affrights the wicked, the poisoning of the arm to bring the hippopotamus low, the going of the runner.

I know the making of amulets which enable us to go without the fire giving its flame on us, or without the flood washing us away. No one succeeds in it but I alone, and the eldest son of my body. God has decreed him to excel in it, and I have seen the perfections of his hands in the work of chief artist in every kind of precious stones, of gold and silver, of ivory and ebony." Mertisen was evidently an "all-round man," and the quiet conviction expressed in "No one succeeds in it but I alone, and my eldest son," is naïve and delightful.

Until within the last two or three years the treasure of Queen Aah-hotep remained unparalleled. But in 1894-95, a French archæologist, M. de Morgan, in the course of systematic explorations around and under the pyramids at Dahshur, near Memphis, the ancient capital, came across a store of wonderful jewellery belonging to some princesses of the twelfth dynasty (about 2650 B.C.). Although many of the pyramids there had been defaced, and secret mausoleums rifled by the foreign Hyksos invaders, yet these caskets had remained undiscovered by them. We have not space to describe the objects at length, but the extraordinary workmanship—most minutely perfect—of the crowns, diadems, necklaces, pectorals, and other ornaments belonging to the royal ladies Sat-hathor, Nub-hotep, Khumit, and others long forgotten, carries back to an earlier date than was hitherto suspected the skill of the old goldsmiths. Their interest for us lies in the fact that many of the objects are in a kind of cloisonné enamel; minute filigree work of gold has been filled in with coloured precious stones or opaque glass enamels. But everything is so bewilderingly tiny in scale. How could the work have been done

without the aid of magnifying glasses? And yet it is not known that the Egyptians were acquainted with lenses.*

It used to be thought that the invention of clear transparent glass came comparatively late in the story of the Egyptian art, and it is true that but few old examples of it are known. Most of the oldest work is in opaque glass pastes or enamels. However, a bead of clear white glass has recently been found at Deir el Bahri, bearing the name of Senmut, the chief architect and favoured official of Queen Hatshepset (whose draught-board we have already mentioned). The queen's nephew, Thothmes III. (1503-1449 B.C.), is celebrated for his mighty campaigns and conquests, and for the great activity in building which took place during his reign. His frequent expeditions to Syria and Phœnicia, the tribute levied, and the prisoners taken led to a gradual modification of Egyptian art, language, and customs. A Semitic influence became strongly apparent; types of ornament and design that had existed from the times of the twelfth dynasty were now put aside, and new ideas came in. Even the racial characteristics began to change; wives, even for the kings, were found among the Syrian peoples. More grace and expression are found in the sculptured and painted memorials; a lighter touch is everywhere seen. The allurements of Phœnician luxury began to undermine the traditional strength

* At the Loan Exhibition of Enamels, held at the Burlington Arts Club, June, 1897, a tray of jewellery of the same age and workmanship as that just described, was lent by Rev. W. Macgregor. This was very interesting, especially as so few specimens are known elsewhere than in the Egyptian state collections.

of Egyptian life and art, and in a comparatively short time, genuine Egyptian and native ideals no longer existed. As in so many other instances, the decay of a national art is contemporaneous with the decay of national character.



EGYPTIAN ALABASTRON.

Marking the intimate connection that from the time of Thothmes III. onwards existed between Egypt and Syria, we find a class of productions in glass of which large numbers exist in public and private collections. The designs are largely of one kind, although infinitely varied in colour; they consist of repeated parallel zigzag or waved lines and bands in strongly contrasted colours. The most prevalent tone is the deep blue, always a favourite colour in Egypt. These markings are not on the surface only; they penetrate some distance into the thickness of the glass. The general mode of manufacture seems to have been this: the body, of one colour—all these glasses are opaque—has been

moulded round a core, or else blown into a mould;

while still hot, threads of other colours have been laid on the surface, pressed down and combed to and fro; the whole has been well fused together, and the irregular surface ground down and polished. The shapes in which this work is generally found are not numerous; there are the alabastron, the amphora, the œnochoe, etc. — shapes very similar to those used in Greek pottery. They were evidently used for containing perfumes and oils for the toilet. The alabastron was so named from the frequent occurrence of the same form in alabaster, a natural material known evidently from the earliest times; it has a long cylindrical outline like a phial. Of amphoræ, there are occasional variations of form; some with feet, others with none at all, so that the vessel must either lie on its side or be carried by its little loop handles. The œnochoi were little jugs with shaped lips. Less frequent than these are the toilet bottles in the form of an Egyptian column, a slightly tapering body with a turned out lip. These appear to have been used for



EGYPTIAN AMPHORA.

containing stibium, or *kohl*, a substance in great demand in the East for staining the eyelids or darkening the eyebrows. Some have been found with the pencils or rods of glass or hematite still inside them by which the *kohl* was applied.

From the wide area over which examples of these dainty glass articles are found, they used to be considered as of either Greek or Roman manufacture. But they are most certainly of earlier date. Possibly a large number are of Phœnician make, copied or suggested by Egyptian originals, and their wide distribution was no doubt due to the business instincts of the Phœnician traders. These astute merchants and colonisers of antiquity do not seem to have originated very much ; they were rather successful exploiters and "middlemen" than artists. Although clever enough to have simplified the cumbrous Egyptian system of hieroglyphics into a handy and workmanlike alphabet, they used it merely for business purposes, and have left no literature of value. It is very unlikely that their claim to the invention of glass can be substantiated. As we have seen, the art was known in Egypt long before the Phœnicians came into prominence, and it is possible that the legend arose from the accidental circumstance that suitable sand was found on the shore under Mount Carmel by a party of merchants who knew already what beautiful work was being accomplished by Egyptian artists. However that may be, the Phœnicians found that the sand at several places along their narrow strip of territory was eminently suitable for glass-making, and from the capital, Sidon, especially, large quantities of glass must have been forwarded to all parts of the then known world. All kinds of glass

were produced; of clear colourless glass more use seems to have been made than in Egypt, and it is spoken of by Pliny in connection with mirrors; in the coloured transparent glass we find beads and imitations of gems, vases, and amphoræ of great beauty. Opaque glass was occasionally used for statuary and small models.

The Phœnician effects of colour are well known. Blue is still in the predominance—a deep transparent blue. Sometimes the body of the vase was in other colours—buff, white, or fawn, and rarely green and red. The lines upon the surface—sometimes few in number, sometimes covering the whole form—are in white, yellow, and light blue, and the freedom and “go” of the half accidental zigzag markings are always very pleasant. For the most part, the colours are as bright as when the pieces were made, but occasionally where the glass has been in contact with the earth, there is some amount of iridescence. This, of course, is a result not foreseen by the maker, yet it is none the less beautiful and indescribable. You can make a list of the tints, but they will convey no idea of the mysterious and spectral light reflected from the surface. One little vase at the British Museum is—but this is not scientific language—“a perfect dream;” imagine a delicate combination of white, pale silver, pink, and gold, with glimpses of dark blue showing through.

The greater number of these “Phœnician” bottles have been found in Greek tombs throughout Greece and the colonies; Sardinia, Melos, Ruvo, Ionian Isles, Camirus (Rhodes), Etruria—these are some of the widely separated spots in which they occur. Although numerous, good specimens are valuable; one little

vase of blue, white, and yellow, in the South Kensington Museum, not two and a-half inches high, was bought for £30.

Confirming the Egyptian origin of this kind of glass, are some specimens of Egyptian earthenware at the British Museum, dated B.C. 1700-1500, actually painted and glazed to imitate variegated glass and the veinings of marble. Very poor they look, it is true; the glaze has nearly vanished, and the painted lines and bands are clumsily done, *but* there was obviously an original that suggested them.

Among the rubbish heaps investigated by Mr. Petrie at Tell-el-Amarna have been found numerous fragments of coloured glass; almost all of it is striped and variegated in the "Phoenician" style. And hereby hangs a tale. Tell-el-Amarna is the site of the deserted city of Khuenaten built by Amenhotep IV. (1383-1365 B.C.). Only within the last few years has it been known what delightful works of art lay hidden there. Professor Petrie found under only a foot or two of earth the stucco floor of a large hall painted with water-pools, plants, and animals in very spirited and freely drawn manner. Jars were dug up with remarkable outline sketches of animals upon them. Extensive use had been made of glazed inlays for the walls and column capitals; green glazed tiles imitating reeds were built up to form other columns; some of the lotus flowers in pale blue and green may be seen in the British Museum. A dado, 200 feet long, of glazed tiles painted with thistle, daisy, fig and other plants in their natural growths, extended along one side of a hall. All this work was in a style quite foreign to the formerly existing Egyptian work, and a great advance upon it in the

direction of naturalism. So far as is known, however, there are no other examples than these at Tell-el-Amarna. No permanent impress had been made by them on Egyptian art.

Here is another strange thing. At Tell-el-Amarna was found a hoard of terra-cotta tablets stamped with cuneiform characters; little rounded slabs of a form not dissimilar to a cigar-case. When the natives dug them up a few years ago, nobody paid much attention to them, and many were lost. When at last it was recognised that to find cuneiform characters—the characteristic Assyrian writing—in Egypt was out of the common way of discoveries, all that were left of these tablets were eagerly collected, and having been deciphered, now explain many uncertainties in the story of the declining power of Egypt. They proved to be letters that had been deposited in “the place of the records of the palace of the king,” and were from governors of distant provinces and kings in various tributary relations to the king of Egypt. Early in the series there are several tablets from Dushratta, king of Mitanni, to Amenhotep III., sending presents of gold, crystal beads, amulets, horses, chariots, and so on, and arranging for a matrimonial alliance between their houses. Amenhotep had, it seems, sent to the king of Mitanni for a daughter to be mistress of Egypt (*i.e.*, wife to the prince of Egypt). Already, Dushratta’s sister, Tyi, was one of the royal wives. Eventually a daughter, Tadukhipa, is sent down to Egypt, and is married to the prince, who, not long after, comes to the throne as Amenhotep IV. Shortly after his accession he suddenly left Thebes, the old capital, changed his style of dress, discarded the old state religion, adopted the wor-

ship of Aten, called himself by a new name, Akhenaten, and began to build a new capital called Khuenaten. The very name of Amen (the chief deity at Thebes) was proscribed, and a pure worship of the sun, Adon or Aten, as the source of all energy, was inculcated. The great hymn to the Aten—one of the monuments of Egyptian literature—is thought to be by the king himself. In the royal sculptures the king and queen are shown worshipping the sun above them; from it proceed long rays, each terminating in a hand. These hands surround the royal figures as if supporting them—a truly graphic although naïve way of indicating the king's reliance upon Divine aid and guidance. The old polytheism was no longer to be tolerated—there was to be only the one god, the living Aten—and “living in truth” was to be the keynote of character.

It is significant that truth and realism certainly distinguish the art of Tell-el-Amarna. The floor paintings, the columns painted with creeping plants evince a direct study of Nature, in marked contrast to the hide-bound Egyptian convention that had for many centuries repressed all individuality.

To whom was this artistic impulse due, and this sudden conversion of the king? The painted halls we have mentioned were in the queen's court or harem. The queen was, we remember, of northern lineage, from Mitanni in Syria. Her father's sister had preceded her into Egypt, and become the queen of Amenhotep, a queen exercising the most powerful influence, and governing the land as regent during the minority of her son. To her, in this capacity, Dushratta addresses his cuneiform letters. From Syria, therefore, evidently came the new ideas which

were as a breath of fresh air in the close atmosphere of Egyptian art and philosophy.

And now, perhaps, we can see the interest that attaches to the little tray of ornamental glass in the British Museum, that bears a label, "Found in the rubbish heaps at Tell-el-Amarna." They record for us the Syrian influence exerted by the Syrian queens. Many presents had been sent to Egypt with them, and doubtless many ingenious craftsmen had followed in their train. While the negotiations were going on for the younger queen, we read that her father sent to the Egyptian king a "gold goblet set with crystals; a necklace of twenty crystal beads and nineteen of gold, in the middle a crystal cased in gold; a necklace of forty-two khulalu stones and forty gold beads," etc. Portraits of both have been preserved; both ladies have a striking and characteristic expression, and of the queen of Akhenaten, a most beautiful fragment of a statue is known, which, although indicating only nose and mouth, is full of vitality and grace.

The king reigned for about twelve years after his sudden adoption of the Aten worship. Twelve years after his death, a new king, Tut-ankh-aten, came to the throne, and although as son-in-law, one would have expected him to have had some sympathy with Akhenaten's ideals, he reverted to the old form of religion, altered his name to Tut-ankh-amen, and the dismantling of the palaces at Khuenaten began. With his successor, Horemreb, all traces of Aten-worship were swept away, the sacred name was erased wherever possible, and the temple buildings demolished.

CHAPTER III.

HEBREW, PERSIAN, AND GREEK GLASS.

OF the connections of the Hebrews with the Egyptians on the one hand, and the Syrians or Phœnicians on the other, we gain a few glimpses in dealing with their use of glass and glazed work. The enforced labour of the Israelites at the close of their sojourn in the land of Goshen was utilised in the erection of treasure-cities for the great Rameses. One of the sun-dried bricks—quite possibly made by some fainting Israelite—stamped while moist with the hieroglyph of Rameses II., can be seen in the British Museum. And not far from it we can see a large collection of glazed tiles with the name of the same monarch; these were brought from Tell-el-Yahûdiyyeh (the ancient Vicus Judæorum), where they formed the ornaments of the palace walls. Rameses had made great conquests; he had overrun all the countries within reach, had penetrated as far as the Orontes, and had fought a great battle under the walls of Kadesh, the capital of the Hittites. It is therefore natural to find among these wall tiles representations of many captives from Asia and Africa. They are drawn with surprising spirit; the modelling in low relief is helped by the method of filling in the garments, backgrounds, and inscriptions in coloured

glasses and enamels. Some of the decorative work representing flowers and fruits is still very fine in colour.

The Israelites escaped from their bondage and occupied the land of Canaan, the inhabitants of which, having long been harried by Egyptians from the south, and by Hittites from the north, were in no position to resist their steady advance. The wanderings in the desert, however, and the unsettled state of the land for many years, could not have been conducive to the cultivation of any of the gentler arts, and it is not till King David's time and the building of Jerusalem, "the City of Peace," that we hear of luxurious furnishings of temples and palaces and the cultivation of decorative work. Under Solomon, the kingdom of Judah quickly reached its most glorious pinnacle. The king's sway extended from Egypt to the Euphrates, and commerce was carried on with Phœnicia, Arabia, India, and the isles of the East Indies. With Hiram, King of Tyre, he had the most friendly relations. In return for corn, wine, and oil, Hiram gave him abundance of cedar wood, and lent him cunning workmen. The fleets of the two kings ranged the seas together, and all the riches of the world were harvested.

Naturally enough the glories of Solomon furnished matter for the wonder, speculation, and inventiveness of later Jewish times. Details, more or less true, in amplification of the Bible descriptions, are to be found in many writers. The Koran states that the floor of the court before the king's palace was of clear glass laid over running water, in which fish might be seen alive. And it is possible that the wonder-seeking Queen of Sheba thought that they were real waters

and gathered up her garments about her. It is curious to notice in this connection the similar notion of an aquatic floor at the Egyptian palace of Khuenaten—due, as we have seen, to Phœnician influence. A pavement of glass or crystal would seem to have always presented some attraction to the Eastern mind; even the Apostle John (Revelation iv. 6) makes use of the picturesque idea.

We know the sequel to King Solomon's magnificence. The king's heart went astray, and he worshipped with unclean rites the strange gods of his seven hundred wives. The kingdom was divided; the great empire fell to pieces, and only five years after Solomon's death, Shishak, king of Egypt, captured Jerusalem and took away all the treasures of the temple and palaces, even to the shields of gold. Of this Shishak (or Shashank in Egyptian wording) there is in the British Museum a gold ring holding a glazed steatite scarab inscribed with his name. There may also be seen scarabs belonging to Shabaka, the "So, king of Egypt," to whom Hoshea, king of Israel, sent messengers, and who was defeated by Sargon of Assyria; to Tirhakah, contemporary of Hezekiah, king of Judah, both being threatened by Sennacherib, whose son, Esarhaddon, and grandson, Assurbanipal, inflicted serious defeats on the Egyptians; and to Psammetichus, founder of the twenty-sixth dynasty, in whose time art and prosperity revived in Egypt, and Greeks and other foreigners were encouraged to settle there.

The name of Sargon, king of Assyria (B.C. 722-705), whom we have just mentioned, is found upon a small glass vase now in the British Museum. It is about four inches high, and has two little projections or ears

on the shoulder. Upon one side of it are engraved a lion and some cuneiform characters mentioning the king's name. The vase was originally of transparent greenish glass, but is now almost opaque with decay. The surface has a pretty green and silver iridescence. It is of rather heavy make, having been



THE SARGON VASE (BRITISH MUSEUM).

evidently blown almost solid, and the interior taken out by a lathe. It was found in the north-west palace at Nineveh, and is an interesting memorial of the Assyrian king who conquered Samaria and took away into captivity the last of the Israelites. Other Assyrian glass objects placed with this are unnamed

but fully as interesting. Five thick glass bowls are of the same age as the vase ; all are much discoloured by mould, but one seems to have indications of the peculiar ornamental effect of fine spiral lines embedded in the substance, which was afterwards to be known as *vitro di trina*. It is possible that this one really is of later date and of Roman manufacture, for there was in later times a Roman colony, Niniva Claudiopolis, upon the same site.

Buried under a quantity of fragments of beautiful blue glass Mr. Layard found at Nineveh a little object that appears to have been a lens. It has one face concave and one plain, but is so discoloured as to be useless for experiments. Some antiquaries see in it an early specimen of a magnifying or burning glass. Others say it is not a lens and is not made of glass. We can examine it for ourselves at the British Museum and decide the question. It is difficult to believe that the terra-cotta tablets stamped with microscopically small cuneiform characters could have been worked without the aid of a magnifying glass.

As large quantities of glazed and enamelled bricks have been found in the ruins of the Assyrian cities, it must be assumed that the knowledge of glass-making was fairly advanced in that country. Blue, white, yellow, black, brown, green, and red, are among the colours used. Some of the bricks were evidently fired on their backs, for the melted enamel has run down the sides. Over some of them there are continuous patterns, the ornament outlined in white and filled in with pale blue, green, and yellow. The violent destruction that came upon most of the Assyrian palaces will account for so few portable objects having been preserved, and it is not surprising

that so little glass has been found. What has escaped the hand of the destroyer time has dealt lovingly with, and the most trivial fragment, long buried in the soil, and now sifted out by the explorer, will glow with strange tints of iridescence.

Glass of later times than the Assyrian kingdom has been discovered in the soil above the ruins of the palaces. Some is of the Greek period (B.C. 300-100); the few pieces at the British Museum include one or two of opaque glass in Phœnician style, the rest are in clear glass, vividly iridescent. Other specimens are quite evidently of Roman period, and of these a fragment of a ribbed dish is, thanks to dame Nature, of superlatively beautiful colour. The iridescence has spread out over a greenish body colour most lovely splashes of orange and greenish gold. One may be quite safe in admiring these masterpieces of Nature's colouring, nor need one fear that the effects will ever become too common. They, fortunately, cannot be imitated by hand, and no glass-worker will want to wait a few hundred years while his buried glass is being matured.

The sister-kingdom of Babylonia was very similar to that of Assyria in its knowledge of the arts. Glazed bricks were used, indicating of course some acquaintance with the materials for glass-making. The Tower of the Seven Planets, built about 600 B.C. by Nebuchadnezzar II., and brought to light by Sir Henry Rawlinson in excavating the mound of Birs Nimroud, was built in stages or platforms, each being faced with bricks glazed in different colours symbolical of the planets, greenish-grey, blue, yellow, pink, red, and black. A white enamel is also found to have been used in Babylonia as in Assyria; in

both cases it was made with tin, possibly obtained from the Phœnician merchants who, we know, brought some of their supplies from Britain, an island which was at that time on the farthest bounds of the known world. Nothing but fragments, so far, of Babylonian glass are mentioned by explorers. Layard, in describing Hillah, the village on the site of old Babylon, says: "On all sides fragments of glass, marble, pottery, and inscribed bricks, are mingled with that peculiar nitrous and blanched soil which renders the site of Babylon a naked and a hideous waste."

The Persian Empire that rose upon the wreck of the Babylonian carried on the traditions of its decorative arts. The palaces built by Darius and Artaxerxes at Susa (the Shushan of the Book of Esther) must have presented a magnificent spectacle of colour. The walls were faced with enamelled bricks, and the floors had pavements of porphyry, marble, alabaster, and stone of blue colour. The excavations made by M. Dieulafoy upon the site in 1884-86 brought to light very remarkable remains of this enamelled faience, and certain portions were brought home to the Louvre; a coloured cast of the celebrated "frieze of archers" has recently been set up in the Persian Court at South Kensington Museum, and will serve to give us an idea of the coloured enamels in use at that time. Among some hundreds of smaller valuables found in the débris, such as engraved rollers, coins, vases, weapons, and so on, were numerous "tear-bottles"—little club-like vessels of glass, no doubt originally used for scents and ointments. [Why are these ancient glass flasks so often called tear-bottles? Is it suggested by David's "Put Thou my tears into Thy bottle"? (Psalm lvi. 8).]

It is recorded of Xerxes (the Ahasuerus of the Book of Esther) that in the course of his journeyings he found the monument of Belus, and, opening it, discovered therein a coffin of glass in which were the remains of the mythical Belus or Baal, the god of the Phœnicians. This is only one of the stories connected with the sacred river Belus, a chief source of the sand that led to the celebrity of the Phœnician glass-work. A Latin historian wrote that "the river though it has a beach of only 500 paces has always been an inexhaustible mine for glass-workers. Between Ptolemais and Tyre the beach is covered with particles of sand of which they make white glass; they pretend this glass will not melt on the river, but only turns into glass when it reaches Sidon." Other writers speak of the sand or of objects buried in it, changing into glass on the beach. Our redoubtable traveller, Sir J. Maundeville, in 1322, speaks of the sand still being used: "Men comen fro fer watre by shippes and be londe with cartes, to fetchen of that gravelle." And if the rabbis are to be believed, Moses knew all about this wonderful river when, in blessing Zebulun and Issachar, he said that "they shall suck of the abundance of the seas and of *treasures hid in the sand*" (Deut. xxxiii. 18, 19), meaning obviously *glass*. Moses from his upbringing in the Egyptian court must certainly have been familiar with the Phœnician productions.

Not very far inland from the sandy shore lies Nazareth, and here in tombs have been found quantities of ancient glass. Numerous examples are to be seen in the glass collection of the British Museum, and will repay examination. There are bottles, flasks, bowls, and cups, mostly in clear glass,

colourless or green, occasionally yellow. Some have a pattern trickled on in blue, or little handles in that colour. Some pieces are in the form of double bottles with looped handles; these were used to contain stibium, and in one there is still the pencil with which the stain was applied to the eyes of some fair one long ago dead and gone. There are also some fragile twisted glass bangles or large rings. Most of this Nazarene glass has acquired by age a delicate pearly iridescence, and possibly dates back to Roman times. Captain Warren in "Underground Jerusalem" writes: "Glass has been manufactured at Hebron since very early times, and though there are so few references to it in the Bible, our excavations attest it was in use at a very early date, and most common during the Roman period. We found broken pieces of glass among pottery at many of the old ruins of Gaza, Askalon, Tell Jema, Ashdod, and other places." The traveller Burckhardt also mentions Hebron as the centre of the modern glass industry, producing beads which had a sale throughout southern Syria, Egypt, and Arabia. Captain Warren states that the sand used at Hebron does not come from the seashore but is found inland.

Egyptian, Phœnician, and Persian were alike mastered by the Greek, and to Alexander the Great fell all the riches of the world. Babylon, Susa, and Persepolis opened their gates to him; Damascus and all the cities of Syria and Palestine submitted excepting Gaza and Tyre, which only fell after long and savage sieges. Egypt, enfeebled by its struggles with Persia, readily welcomed the victorious Greek, and the new city of Alexandria commemorated his name. Here he was buried in a golden coffin, and

divine honours were paid to the conqueror who could conquer all men but himself, closing his short and brilliant career in an inglorious drinking-bout.

Under his successors, the Ptolemies, Alexandria became, next to Rome and Antioch, the most magnificent city in the world. With its famous library of manuscripts—destined to be partly destroyed 600 years later by a mob of fanatic Christians, and entirely so 250 years after by the Arabs—it was the resort of all the scholars of antiquity, and Greek learning and literature brought refinement to a city that from its favourable position soon became the centre of the world's commerce.

Here quickly congregated clever workmen in all the arts to minister to the luxurious tastes of the rich, and among them must have been numerous Egyptian and Phœnician glass-workers. The Alexandrian glass was largely exported, and workmen from that city probably carried the secrets of manufacture to Rome, which was afterwards to be so celebrated for its glass. Some writers indeed attribute many of the elaborate examples of Roman glass—such work, for instance, as is found in the Portland Vase—not to Rome at all, but to Alexandria. As late as the time of Aurelian (died A.D. 275) a tribute of glass was exacted from Egypt. Strabo the geographer, who lived about the time of Christ, was told by the glass-makers at Alexandria that the many coloured wares for which they were famous could not be made without a certain earth found in Egypt. It is easy to imagine that the works of art emanating from such a busy centre would combine the ingenuity and workmanship of the Egyptian with the passion for colour of the Phœnician and Persian, and that both would be

controlled by the innate taste and refinement of the Greek.

Conspicuous as is Greece in the history of pottery, its vases at their best periods presenting an ideal in form and decoration that has in its way never since been excelled or approached, it is singular that the Greek artist does not hold a similar supremacy in the story of glass-making. There is, strangely enough, no specially distinctive style of Greek glass. As we have already said, large quantities of the Phœnician striped work are found everywhere on Grecian soil and in the countries round the Mediterranean, and its shapes are very often quite Greek in feeling. But most students of the matter do not think that it is of Greek manufacture. The glaze found on Greek pottery is not of a glassy nature, and the rich colour effects that contemporaneously were in use in Persia find no counterpart in Greece. In their incomparable pottery, the Greek artists contented themselves with beautiful form and drawing, and seem to have left colour to other nations.

Glass, indeed, does not appear to have been known to the early Greeks. Homer does not mention it. Aristophanes (450 B.C.) speaks of the Athenian ambassadors to the capital of Persia drinking there from cups of gold and glass, and this would imply that for such a use the material was considered as of equal value to the precious metal. In the next century, the painter Pausias, in representing the subject of "Intoxication," introduced a woman drinking from a transparent glass bowl. Thereafter the material must have come into more general use, and we read of vases, jars, and plates in clear glass, and of imitation gems and cameos in coloured glass.

A limited use seems to have been made of glass for architectural embellishments, there being traces of glass inlay in various temple sculptures—possibly suggested by the much older Egyptian mosaics. Pliny relates that upon the tomb of Hermias, on the coast of Cyprus, there was a marble lion with eyes of emerald, and that these eyes were so intensely bright as to frighten the fish away. In order not to ruin the fishermen it became necessary to remove the too brilliant optics. Herodotus also wrote that at Tyre he saw a column of emerald. It is generally assumed that in both cases the emeralds were nothing more than coloured glass, and that the historians were indulging in a slight exaggeration.

CHAPTER IV.

ROMAN GLASS.

IN studying the numerous varieties of Roman glass, we arrive at the culmination of the glass-worker's art of antiquity. The empire, which in a few centuries had grown up from the tiny kingdom of Romulus till it embraced almost the whole world, had swept within its net all the knowledge and art and skill of the craftsmen among its conquered states. Etruria, Carthage, Gaul, Macedonia, Greece itself, Syria, Egypt, Spain, Britain, Germania—each in turn added its share to the wealth and luxury of the Empire, and among the arts that flourished under such favouring conditions, that of glass-making received an enormous stimulus. From the large number of specimens—fragmentary or whole—found wherever Roman arms penetrated, it would appear that glass must have been used for more purposes and to a greater extent in many ways than even at the present day. Not only for costly works of art, but for common and useful articles too was the material available. Methods of making and decorating were in use in great variety, and many an idea developed by later Venetian workmen can be traced to a Roman original. It is interesting to see the great use that was made of clear glass; one might

have expected that the Roman desire for ostentation would have found an uncoloured material, depending for its interest mainly on the form of the object, too simple and unassuming. One very common application of the clear glass is for urns to contain the ashes of the dead. We owe the greater part of these that remain uninjured to the fact that they were enclosed in tombs and have thus been protected from harm. Almost every collection of Roman antiquities will have its examples of these urns, often with the handful of bones and dust still within them. They are mostly of good form, of blown glass, with sensibly strong and broad handles on the shoulder—a type of design that might very well be imitated for the crematory urns now coming into use among ourselves. Many of them have assumed an iridescence that is very beautiful, and very few are really transparent; it is probable, however, that the purest crystal glass was not employed for any but the choicest work. It was, no doubt, difficult for the ordinary maker, working on a small scale, to produce glass free from discoloration and bubbles, and nearly all the domestic vessels found will be of a slight green or yellowish tint caused by the stain of iron in the sand.

There is a small and well-arranged collection of Roman glass at the Guildhall Museum, consisting for the most part of objects found in excavations in London. Although by no means complete, it gives an idea of some of the more ordinary kinds of glass. Among them we may notice a sepulchral urn with looped handles found at Allhallow's, Barking; two large squared bottles found at Moorfields; a broken amphora from the Minorities; tiny bottles of club-like shapes, probably used for unguents; bowls with raised

ribs on the outer surface, of the kind known as pillar-moulded—these are mostly of clear green glass, but a few are in yellow, blue, or brown, and one found under Gracechurch Street, is in dark blue; one odd fragment is the neck of a simpuvium or sacrificial vessel formed by two flasks flattened together and their orifices brought into the one neck; and in opaque glass there are some beads of combined colours.

Dealing for the present with clear glass only, we must see what they have in the splendid collection at the British Museum. There is a long and stately row of cinerary urns; one of them is conspicuous by the extreme splendour of its iridescence, in which patches of gold on the dark green ground contend with vivid blue and purple flushes. Some of the plain blown bowls are decorated with blobs and trickles of glass, disposed in vertical lines round the outer surface. A goblet has these lumps placed, *en échelon*, in a way that was much in use in Germany later. There is, among the smaller bottles and flasks, one, found in the Fayoum oasis in Egypt, that retains its original wrapping of rushes. Other examples of the decoration by means of threads trickled on, will show, perhaps, a thin line of opaque white forming a spiral round a bottle of clear blue, or reversing the idea, will have lines of transparent blue upon an opaque white jug. There is a large jug of transparent brown with splashes of opaque white all over it. A few "conceits" in glass have survived the touch of time; here we may see a glass boat found at Pompeii, or a long-tailed bird found at Cumae, or a drinking-cup in the form of a grotesque helmet found at St. Severinus, Cologne.

The "pillar-moulded" glass is one type of a large

group of objects, formed by blowing the glass into moulds, or on to carved surfaces, so that the impression of the modelling is retained by the glass. Among the simplest of this kind are the little bottles in the form of dates,* pine cones, scallops, etc., obviously moulded from the real things. These, it is thought, were produced at Sidon during the Roman period. With them are numerous tiny vases with raised ornament of musical instruments and figures. More elaborate, but produced in the same way by moulding entirely, are the cups and bowls with representations in relief of circus and gladiators; sometimes the names are added. Occasionally moulded ornaments of masks were added to plain blown bodies. Some vases have been found with the maker's name and city—*Artis Sidon*—stamped on the handles. A moulded cup (at the British Museum) from a tomb in Cyprus has upon it "Exult and be glad;" another, found by General Cesnola also in Cyprus, has the



MOULDED DRINKING-GLASS.
(*Roman.*)

* One of the "date" scent-bottles at South Kensington Museum cost £7.

name "Ennion" and the adjuration, "Remember this, O buyer;" another, presented by the Cyprus Exploration Fund, has, in Greek characters, in relief, "Good cheer." One long-necked bottle was produced in a simple way by blowing into a cage made of wire; the glass has been indented all over in a regular pattern.

One drinking-cup that hardly falls within our classification may be seen at the British Museum; it is of thin silver, pierced with a patterning of holes, through which drops of blue glass exude, giving the appearance of a goblet studded with sapphires. This method suggests the transparent enamels of mediæval times, and in another way, the Chinese "grains-of-rice" wares, where a cup of thin porcelain was perforated in patterns to be filled up again by the clear fused glaze in which the whole piece was finally dipped.

To make use of engraving for the decoration of glass must have been easy to such expert gem and cameo workers as were at the service of the rich Rôman, but only a few examples of importance are known. At the British Museum there is a dish engraved on the under side in thin lines, with a representation of Apollo and Minerva; it was found at Halicarnassus, and is not very good in style. With it are three other dishes, found at Amiens, engraved in a similar way. Dishes of this kind have been found engraved with figures of Christ and the saints. They probably date from the fourth century, and, it is supposed, were used in the early Church. It is stated that Pope Zephirinus, early in the third century, required patens of glass to be used.

Leading to more important artistic results was the

practice of cutting and carving glass, the work sometimes being executed in the transparent varieties, but more often in what was known as the cameo style, in which glasses of different colours are combined in layers, and carved through from the outside, exposing the colours in turn. By this method were produced some most remarkable works. The few that remain entire are of great value. In the Museum at Naples is an amphora that was found at Pompeii in 1839; it is only 12½ inches in height, and is supported on a stand of silver. The body of the vase is of deep purplish blue; over this has been laid a coating of opaque white glass, carved into an elaborate design of boys gathering grapes and playing musical instruments, with goats, sheep, masks, and foliage filling the remainder of the space. In the



THE NAPLES AMPHORA.

British Museum are the fragments of the Auldjo Vase; this also was found at Pompeii in the house of the Faun. Part of it was bequeathed to the Museum by Miss Auldjo, and other portions were subsequently purchased; they have now been mounted together,

and show—although incomplete—that the original shape was that known as a Greek œnochoe of about



THE AULDJO VASE (BRITISH MUSEUM).

nine inches in height. The ornament is in white on a dark blue ground, and consists mainly of vine-leaves and grapes.

The most famous, however, of these examples of the glass-cutter's skill is that known as the Portland Vase. This is also in the British Museum, where it has been deposited since 1810. It measures ten inches high, and is really rather clumsy in outline, but its decoration is carved in most exquisite style. Like the Naples and Auldjo examples, this has white reliefs on a deep blue ground. The figures are assumed to represent, on one side, Thetis consenting to be the bride of Peleus, in the presence of Poseidon and Eros, and, on the other side, Peleus and Thetis together on Mount Pelion. On the underside of the vase is a large head of Paris. The Greek character of the subjects and workmanship seem to lend colour to the idea that this choice piece of antique art was produced at Alexandria, and not later than 150 B.C.; it was, however, found during the seventeenth century in a marble sarcophagus in the Monte del Grano, near Rome. The tomb is thought to have been that of the emperor, Alexander Severus, and his mother, Julia Mamæa, both murdered near Mainz in 235, during an expedition taken to defend the Rhenish frontier. The vase was, when found, deposited in the Barberini Palace at Rome, that treasure-house of one of the richest Italian families, and is hence sometimes called the Barberini Vase. It was for many years described as carved from a natural stone—a sardonyx or an agate. Winckelmann and Wedgwood came to the conclusion that it was glass. Owing to losses at card-playing, a princess of the house had to sell some of her family treasures. Among them was this vase, and, although the pope forbade the sale, it was acquired in 1770 by Sir William Hamilton (the husband of the beautiful

Lady Emma), author of many sumptuously illustrated works on antique art, for the study of which his post of English Ambassador at Naples gave him unusual facilities. From him it passed to the Duchess of Portland, and, at her death, came into the auction room, where the new duke bought it again at £1029. He subsequently lent it to the British Museum, where it had remained in safety till 1845, in which year it was wantonly smashed by a lunatic. Skilfully mended, it now rests among the rarest treasures belonging to the Museum, placed apart in the "Gold Room."

Josiah Wedgwood, the celebrated potter, who had been successfully imitating in earthenware many of the examples of cameos and engraved gems illustrated by his friend, Sir William Hamilton, was keenly desirous of acquiring the vase, bidding up to one thousand pounds for it at the auction, and, on its purchase by the Duke of Portland, obtained permission to copy it in his "jasper-ware." He paid his modeller, Webber, five hundred pounds for a year's work in making an accurate model of it, and proposed to recoup the outlay by issuing fifty subscription copies at fifty guineas each. By the time they were supplied, much more than this had been expended. Wedgwood's copies, being of pottery, lack the sparkle and close texture of their glass original, but are interesting examples of what was possible to the enthusiastic and patient master-potter. In describing the Portland Vase, he wrote:—

"It is apparent that the artist has availed himself very ably of the dark ground in producing the perspective and distance required by cutting the white away nearer to the ground as the shades were wanted

deeper, so that the white is often cut to the thinness of paper, and in some instances quite away, and the ground itself makes a part of the bas-relief, by which means he has given to his work the effect of painting as well as sculpture; and it will be found that a bas-relief, with all the figures of a uniform white colour upon a dark ground, will be a very faint resemblance of what this artist has had the address to produce by calling in the aid of colour to assist his relief. That hollowness of rocks and depth of shade in other parts, produced by cutting down to the dark ground, and to which it owes no small part of its beauty, would all be wanting, and a disgusting flatness appear in their stead. It is here that I am most sensible of my weakness, and that I must of necessity call in the engraver to my assistance, in order to produce the highest finished and closest copies we are capable of making." The vase has been copied in glass in modern times, not unsuccessfully. One is inclined to think, certainly, that the time and skill required to copy an example of antique art might have been better spent in some piece of original work.

The numerous fragments of cameo glass that have been found make it clear that, costly as the process must have been, it was not uncommon. One of the early fathers of the Church, Clement of Alexandria, is even found to mention the "chiselled glass" as an effeminate luxury, "a pretentious, useless vainglory, good for nothing but to be broken, and to cause to tremble all those who lifted them to their lips." The good father's pious wish has been well fulfilled as regards the breakages, and we are now reduced to the study of the antique art as well as may be from its fragments. Most of those in the British Museum

are of similar colouring to the Portland Vase—white on blue ; a few show other colours, sometimes reversing the effect, the outer layer of glass being coloured, while the inner is of colourless material. On some rare specimens more than two colours may be found.

Mention must be made of the separate reproductions of cameos and gems in moulded glass of different colours. In the making of these artificial gems the Romans were very expert. The story is told of a jeweller who cheated the empress, Salonina, wife of Gallienus, and she, becoming aware that the trinkets she had purchased were not genuine, demanded of the emperor that the jeweller should be thrown to the lions in the circus. The unhappy tradesman prepared for death ; the vast crowds of spectators were gazing down into the arena at the miserable figure ; the signal was given for opening the cage. No lion, however, appeared. Instead, there strutted out a cock, who greeted the victim with a loud crow. Whether this happened by design or accident, the emperor considered it was punishment enough, and the jeweller escaped with a lesson.

Some of the real cameos and engraved stones that were thus imitated are magnificent specimens of art. A sardonyx in the Imperial Museum, at Vienna, measures nine by eight inches, and is said to have cost £6000. Another still larger, at Paris, is a sardonyx of five strata, and measures thirteen by eleven inches. There are no examples so large as these at the British Museum. The collection, however, is a very valuable one, and in portraits of the emperors is especially rich. Many of these are ancient *pastes*, that is, casts made of glass—transparent or opaque—by pressing the semi-fused material in a mould. No

doubt the larger number of these glass casts would be left untouched from the mould ; but some were certainly finished by the engraver. An authoritative writer on gems states that ninety-nine in every hundred of so-called antique pastes are modern frauds.

Cameos of glass are not uncommon, some being of large size, and in strikingly contrasted colours, such as green on red. In South Kensington Museum is a beautiful tablet about five inches high, in blue opaque glass. Smaller buttons and discs of moulded glass are thought to have been used for decorations on armour or harness.

A method of decorating clear glass remains to be mentioned—viz., with gold leaf either placed on the surface or, in the better work, embedded in the glass. Most of this kind dates from early Christian times, having been found in the catacombs, and from the prevalence of sacred symbols, representations of the saints, and pious mottoes, it is supposed that the bowls and plates in which this particular decoration occurs were used for sacramental purposes or for the “love feasts.” Such inscriptions as BIBE VIVAS or PIE ZESES (“Drink and Live”) occur. The general process pursued seems to have been to place the leaf of gold on the inside surface of a thin bowl or plate, scratch the ornament through the gold and remove all portions not required, add the enamel colouring when any was intended, and then cover the whole inside with a second very thin sheet or bowl and fix them together by remelting, thus imprisoning the decorations. Where this second coat of glass has not been added, the decoration in gold has almost disappeared—it could have been attached but very

slightly. A beautiful piece of work found at Cologne consisted of a central cup decorated with winged genii and flowers in gold, and then enclosed with a network of thin threads of glass. The specimens of gold decoration from Canosa (Southern Italy), to be seen in the British Museum, are remarkably good, and with them are some cups, bottles, etc., of undecorated glass with a most extravagant iridescence of powerful purples, blues, greens, reds, and golds.

Similarly iridescent are some little pieces of Roman window glass found at Pozzuoli. That the Romans had glass windows seems pretty certain, but they probably could not see through them—in that respect we have improved on early times. The glass seems to have been cast on a stone bed, and is usually very uneven in surface and coarse in material. In the house of the Faun at Pompeii a little pane of glass remains in its frame of bronze, and it is stated that the Baths in that same long-buried city had windows of cast glass, one of a single pane measuring 44 inches by 32. Squares of glass were used for greenhouse or garden frames. For better windows, thin sheets of marble, alabaster, mica, or shells were employed. Fragments of Roman window glass found in London may be seen at the Guildhall Museum. Our climate probably made it more necessary to have such protection than the warmer air of Italy.

From windows to mirrors is no great step. The fact that glass could be used for this purpose was known at an early age. Aristotle, the tutor of Alexander the Great, states that "if metal or stones have to be polished to serve as mirrors, glass or crystal require to be lined with a leaf of metal to

throw back the image presented to them." It is not certain, however, that the Romans had mirrors of glass. Such would require a very pure glass and a method of producing it in large flat pieces and of polishing it, not to speak of an efficient method of applying the metal or reflecting surface to the back of the glass. Good mirrors of glass were not made till well on into the mediæval times, and it is therefore fairly certain that the polished metallic mirror of antiquity was not soon superseded.

It is time now to speak of the Roman mosaic glass work, and the extraordinary variety of methods and beauty of effects obtained will leave us with the conviction that, in their coloured glass, the Roman artists were inimitable. With the comparatively limited range of colour available to them, the loveliest combinations were obtained. Of transparent colours they had blue, green, purple, amber, brown, and rose, and in opaque glass, white, black, red, blue, yellow, green, and orange; of several of these there would be different shades and tones—eight or ten blues, almost as many greens, and various kinds of reds. With these materials mixed in the mass, with one another, or with plain white or colourless glass, several of the precious stones were imitated, jacinths, agate, sapphires, porphyry, onyx, and so on. Another imitation that was most highly esteemed cannot now be identified—viz., murrhine; it is thought to have been a transparent purple with veins of opaque white.

The large class of effects known afterwards to the Venetians as "*mille fiori*" suggests an Egyptian origin, and it is pretty certain that the Romans were indebted to Egypt for most of this work. Not altogether, it is true, for fragments of the canes or rods

of glass used in the process have been found at Rome. The foundation of the method lay in the preparation of the canes. Threads or small sticks of different colours were arranged together in a pattern, melted together by heat, and drawn out while hot to an indefinite length, reducing the diameter of the combined rod, but retaining the intended pattern



BOWL OF "MILLE FIORI" GLASS.

unchanged throughout its length. Cut up into small pieces, here we have a cylindrical bead. Some of the patterns thus obtained by the gradual narrowing of the elongating canes are of extreme minuteness and beauty, requiring a powerful lens to reveal their workmanship. In the British Museum is a tray of rods thus prepared ; some are plain squares, some are

of combined colours. From a Roman glass factory at Tanis in Egypt there are also some mosaic rods for inlaying.

Short sections of these rods placed side by side, and united by heat, thus produced a recurring pattern of greater or less complexity and richness. The variety of the patterns is extraordinary. Several walls in the Glass Court at South Kensington Museum are lined with frames, each containing a large number of fragments of this work, and the pieces all appear to be different in design and colour. They will repay the most careful examination. Some suggest the madreporé coral. There is one particular kind of effect that seems to us especially charming, in which, swimming in a body of translucent dark green glass, numerous little tubes of pale green are set slantwise. The specimens at the British Museum are equally interesting, although not quite so overwhelmingly numerous. Here one should notice the tartan-like patterns. An enthusiast for the tartan might reasonably, on seeing these, discourse of the ubiquity of the Scotchman even at that early date.

Complete vessels of Roman *mille fiori* are rare. It does not seem to have been a general practice to place objects of any value in the tombs, and it is to these undisturbed resting-places of the dead that antiquaries look, as a rule, for the more perfect examples of the portable arts of antiquity.

More fragile even than the *mille fiori* have proved to be the vessels of laced glass (the *vitro di trina* of Venetian artists), and there are still fewer unbroken examples of this method than of the other. The essential feature of the process was a rod of clear

glass with threads of opaque or coloured glass twisted into it. Vessels were then formed by placing the rods together longitudinally, and causing them to cohere by heat; bowls and dishes could be formed by carrying the rod round continuously in a spiral widening at each revolution. In this method patterns of extreme minuteness could be obtained by drawing out the rods, and so narrowing the diameter; some of the coils and twists embedded in the clear glass are dazzlingly close. Occasionally a piece is found in which the rods of different colours appear to have been plaited together; one such bowl, built up of yellow, red, white, and blue stripes, is shown at South Kensington, having been purchased for £125.

To many, the examples of glass-work we have been last describing are altogether more interesting than the cameo and cut work. The methods of workmanship seem more craftsmanlike, more appropriate to the material being used, and the effects produced are effects that can be got in no other way and in no other material. It is true that a very characteristic way of working glass—viz., that of blowing, does not receive prominence, but that the Romans could produce blown glass, and of good forms, is quite clear from the cinerary urns and numerous shapes of smaller vessels.

The idea of embedding a pattern of coloured glass within a mass of another colour, was further utilised in the manufacture of glass tiles for wall coverings, and even for pavements. Some pieces found at Pompeii show stars or rosettes made up of sections cut from the same rod, and surrounded by a field of lavender-coloured opaque glass. The most careful pains seem to have been taken in shaping and

grinding pieces of glass to form wall decorations. Of one citizen it is recorded that "his wealth was much spoken of, for he is reported to have covered his house with squares of glass attached by bitumen and other cements." Under the name of "opalite," the same idea is being revived now, and walls are now being built with, instead of glazed bricks, common bricks with a thin facing of glass afterwards attached. There is no reason why the colours available should not be more satisfactory than the somewhat crude and startling tones which at present seem alone to have been chosen ; as to the cleanliness of the glassy surface, and suitability for positions where our town walls are subjected to friction and dirt, there can be no question.

With mosaic work the Roman edifices were abundantly supplied. "Discovery of a Roman pavement" might almost be a permanent headline in those journals that record such things. Whenever a Roman site is excavated, a pavement is almost sure to be lighted upon. All kinds of materials were used ; for the most part marbles and coloured stones, often tesserae of pottery, and not infrequently glass. In one of the rooms of the house of the Faun, a pavement of variously coloured marbles was found with pieces of purple and opaque red glass inserted. Near the Coliseum at Rome there was found a pavement of slabs of glass, white, green, and blue, while another found near Rome is of green glass slabs only.

For the wall mosaics more elaborate schemes of design and colour were adopted. In some decorations the pictures are built up with pieces of marbles, some portions only being in glass, but as time went

on, desire for greater brilliancy perhaps led to glass being wholly used, and we come then to the gold backgrounds and colossal glass mosaics of the Byzantine school. These we must refer to in another chapter.

We have found so much of interest to say of Roman glass, that it seems unfair to finally mention an example of it that is hopelessly bad. At South Kensington Museum there are portions of mosaic work—more or less dilapidated, and they might very well be broken up altogether—from the ancient seaside resort of *Baiæ*, where in the splendid days of Roman empire, it was considered absolutely necessary to have a villa. Horace, it is stated, preferred this abode of elegance to all other places in the world. Now deserted, it lies in ruins, partly submerged by the sea. It is often said that the Roman at heart was never an artist. He was a good warrior, manager, provider, and generally practical; but his artistry had to be found for him by men of other countries. Perhaps in this work from *Baiæ*, we may see the unaided efforts of the Roman. Here is a fountain niche that recalls our own childish achievements in grotto-building; mosaic very roughly done; design non-existent; framed up by lines of real shells. Here is a column, stuck all over with mosaic, bristling with bits of glass. If there is one separate architectural feature, more than another that does not call for embellishment of this kind, it is the column.

CHAPTER V.

EARLY CHRISTIAN, BYZANTINE, AND SARACEN GLASS.

AMIDST the general ruin that ensued upon the fall of the Roman empire, the art of mosaic-working survived, and in the newly-founded empire of Byzantium was allowed to contribute in no insignificant degree to the sumptuous decorations of the imperial buildings. At the recognition of Christianity, and its adoption by Constantine as the religion of the State, the places of worship were planned on what was called the Basilican model. It was impossible for the Christians—until then, so cruelly persecuted by the representatives of a pagan religion—to adopt the heathen temples for their meeting-places, but to the basilicas or halls of justice no objection seems to have been felt, and the once obscure band of Christians stepped from their hiding-places in the catacombs to the broad and open daylight of the great basilican churches. The timid little paintings in the tunnelled catacombs gave way to the immense spaces of mosaic in the new buildings; the touching symbolism and pathetic hopefulness of the earlier work was now forgotten in the strange gleam of the great mystical figures of Christ in glory surrounded by saints. The mosaics at the basilica of S. Maria Maggiore at Rome are typical of the usual

arrangement of subjects. Over the pillars of the nave are Old Testament figures which increase in splendour until at the great arch over the chancel they are stopped by some scenes from the New Testament, such as the Annunciation, Massacre of the Innocents, the Presentation, and the Adoration of the Magi. Over these is the Lamb seated on the Throne. In the picture of the Adoration, as now visible, there are two seated figures, the Christ-child and the Virgin. The latter, however, is not part of the original work, but was altered in the last century by Pope Benedict XIV., who thought that the mother of our Lord was not sufficiently honoured. He erased a *standing* figure of the Virgin, and gave her a *seated* representation by putting a nimbus round the head of one of the magi, a figure in a long blue mantle.

One very interesting feature of these early Christian mosaics is the "Likeness of Christ." At quite an early date a characteristic type of physiognomy was evolved, and one that varied but little during the after centuries. A very early example was preserved at Rome, and probably served as model for the others, but as to how far it could be accepted as an authoritative portrait, the opinions of the learned have always differed. One of the finest types is the colossal figure of Christ in the apse of the Church of St. Cosmo and St. Damian at Rome.

With the erection of the great church at Constantinople, dedicated to the Holy Wisdom, *Santa Sophia*, a great change, far-reaching in its effects, took place in the character of Christian art. What it meant in architecture it is not possible here to say, except that the vast surfaces of walls and vaults necessitated by the Byzantine use of the dome seem to have been

at once accepted as suitable for an applied mosaic decoration—a mosaic of large slabs of marble on the lower walls, and of glass cubes or tesserae on the ceilings and upper walls. The quieter dark blue ground of the Roman mosaic no longer appears, the richly draped figures of emperor and empress, courtiers and angels now are surrounded by great spaces of broken gold. The type of figure becomes terribly stiff with exaggerated features and stern expression ; rigid formality, excessive stateliness, characterise the figures on the walls as they seem to have characterised the pomp and ritual of the services held within the walls. Reproductions of typical portions of these mosaics may be studied at the South Kensington Museum, but, of course, suffer terribly in effect in being shown without appropriate surroundings.

The original church built by Constantine when he established at old Byzantium the new capital to be called by his own name, happened to be burnt early in the reign of Justinian (A.D. 527–565). Famous Greek architects were called in, and the new church of Santa Sophia came into existence. It has ever since been considered one of the wonders of the world, although now disfigured by Mohammedan additions. Sir Gilbert Scott, our famous English architect, wrote of it : “ When we consider the whole as clothed with the richest beauties of surface—its piers encrusted with inlaid marbles of every hue, its arcades of marble gorgeously carved, its domes and vaultings resplendent with gold mosaic interspersed with solemn figures, and its wide-spreading floors rich with marble tessellation, over which the buoyant dome floats self-supported, and seems to sail over you as you move—I cannot conceive of

anything more astonishing, more solemn, and more magnificent."

At the old town of Ravenna in Italy, conquered by the Emperor Justinian (and afterwards to be the burial-place of Dante), the Byzantine mosaics may be well studied. The basilica of S. Apollinare Nuovo, built by Theodoric the Goth, has on its walls a wonderful double procession of saints and martyrs, while above in golden niches between the windows are thirty apostles and saints. Another basilica, S. Apollinare in Classe, a building of Justinian's time, has portrait figures of 150 bishops, and in the apse a great "Transfiguration," the first instance of the representation of this subject.* The domed church built in honour of Saint Vitale, the soldier buried alive at Ravenna for witnessing to the faith, is famous for its octagonal plan and for the mosaic portraits on its walls of the emperor and empress themselves—Justinian, the slave who became successively consul, joint-emperor, and sole-emperor of the reunited East and West, and Theodora, once dancer and actress of doubtful antecedents, now his ambitious and courageous consort. They are surrounded by courtiers, soldiers, and Roman ladies in the richest garments, and although Justinian and Theodora have each a nimbus, they do not look particularly saintly. We may herein see that intrusion of personal aggrandisement which was ultimately to drive out the simplicity and devotion of the earlier work. Mr. Ruskin says: "That Roman Christian art work is the exact expression of Christianity at

* At South Kensington Museum there is a copy of a mosaic of the "Good Shepherd" in the Mausoleum of the Empress Galla Placidia at Ravenna.

the time, very fervid and beautiful, but imperfect, in many respects ignorant, yet radiant with a strong



EMPRESS THEODORA.
(*From the Mosaics at Ravenna.*)

childlike light of imagination, which flames up under Constantine, illumines all the shores of the Bosporus

and Adriatic, and then gradually, as the people give themselves up to idolatry, sinks into a strange gilded and embalmed repose, with the religion it expressed."

The Byzantine churches were generally lighted by a series of small windows round the base of the domes. At S. Sophia, some of the original plates of cast glass still remain. Coloured glass for windows does not seem to be mentioned before the time of Leo III. (795), but it was most probably in use before that time. A very common method of introducing it, and one still in use in the East, was to perforate slabs of marble, or even hard plaster, in certain patterns of openings, and insert the small pieces of glass as a kind of mosaic. The Cairo room at South Kensington Museum has eleven of such windows, the stucco panels being framed in wood and placed side by side as a kind of frieze to the wooden-latticed balcony or *meshrebiya*. The perforations in the stucco form designs representing vases of flowers, trees, or sprays.

The glass-workers settling at Constantinople were soon of sufficient importance to give a name to one of the gates of the metropolis, and when the advancing tide of Mohammedan invasion swept up to the walls, and the emperors of the East were hard pressed, mosaic and mosaic workers were often handed over to the Caliphs to enable them to decorate their new mosques.

A reaction against the excessive use of images and pictures set in at Constantinople towards the eighth century, and by an edict issued in 726 by the Emperor Leo XIII. it became compulsory to remove all representations except that of our Lord alone. This sweeping condemnation was followed by an-

other decree which made it an offence punishable by death to pay any sort of reverence to a sacred figure. Not everywhere could this be enforced, and in Italy especially the Iconoclasts were hardly listened to. But in the Eastern Church the idea of Iconoclasm remained, and survives in the modern Greek usage of permitting sacred pictures, while forbidding carved representations of sacred objects. The typical Russian *icon* or sacred image, is a curious relic of the old Byzantine art. Grotesquely stiff figures with stern fixed faces, set in the midst of tinselled and jewelled plates of draperies bedecked with beads and looking glass, combine to form such a trivial horror as could only result from centuries of conventional art and the suppression of all individuality.

Through the veil of obscurity that hangs over the history of glass for some centuries after the early Byzantine times, very few facts of importance can be discerned. The art did not wholly die out, but gradually it must have fallen into disuse, and one by one the old secrets of manufacture were lost as one by one the old workers dropped out of existence. A few pieces of old glass exist that are ascribed to these "Dark Ages." There are some cups in the Treasury at St. Mark's, Venice, which were probably stolen from Constantinople in A.D. 1204, when the French and Venetians drove out the Greeks and founded the short-lived "Latin" Kingdom. These cups are mostly of thick greenish glass, cut with the wheel; one, however, is a small vase of dark brown glass decorated with pseudo-classic figures in enamel and gold, and bearing some inscriptions in Cufic characters which have hitherto not been understood, nor perhaps are likely to be, for it is no unusual thing to find the

old workmen making up sham inscriptions because the letters and flourishes looked pretty. At Genoa is preserved the *Sacro Catino* or Holy Dish, brought by the Crusaders from Cæsarea in 1101. It was for years believed to be an emerald, but is really of green glass of fine colour, containing many small air bubbles. It is a hexagonal shallow dish with a foot and handles, and a little ornament. Curious it is to observe how the notion lingered on, here and there, of precious things formed of huge emeralds. Herodotus and his column of emerald at Tyre, found a counterpart in quite late times, when in 1730 the prior of Reichenau on the lake of Constance, was taking the most elaborate precautions to ensure the safety of a huge emerald two feet high, thirteen inches wide, and three inches thick. According to tradition, it had been sent as a present to Charlemagne, by Irene, the ambitious empress who all but succeeded in her project of marrying the great emperor of the West. This enormous emerald was nothing but a slab of transparent green glass. The story of the conquest of Gothic Spain by the Moslems, brings to light another fabulous emerald of great size. The Moorish commander Musa was summoned to Damascus by the Caliph, and fined 100,000 pieces of gold for assumed acts of peculation and diversion to his own use of the booty taken in Spain. Among the treasures captured at Toledo, and retained by Musa, was a wonderful table made of a solid emerald, and standing on three golden feet; it was said to have been made for King Solomon. As it is also described as having inscriptions in Greek, it was probably nothing else than Byzantine green glass.

Irresistible as the Arabs were in their advance

throughout most of the world, they did not succeed in capturing Constantinople till the fifteenth century. It was fortunate that their earlier attempts were not successful. Professor Freeman was of opinion that had the Mohammedans effected an entrance in the early days of their successes "it would seem as if the Christian religion and European civilisation must have been swept from the earth." One reads that siege after siege was repelled by the aid of a fearsome composition called "Greek Fire," the secret of which was kept at Constantinople for centuries. In the British Museum are shown some globes of very thick glass which were found at Rhodes, and are believed to have been used as hand grenades for scattering the dreaded combustible.

The remains of old Arab or Saracen glass are not numerous. For the most part the Arabs seemed to utilise the services of the workmen they found in the conquered countries, and clever artists of any nationality seem to have been welcome. Thus Persian potters and tilemakers seem to have accompanied the Moslem armies on their onward march, and to have founded manufactories of pottery as far west as Spain. Examples of Saracen glass are not so important, however. In the British Museum is a series of glass weights or tokens; they are of several colours, but mostly of transparent green glass. They are stamped with the names of different caliphs of Egypt, and the dates range from 760 to 1225. One, for instance, has the inscription, "By order of Obeyd Allah, son of Alkhebkhab, this has the value of a feston or twenty kharouba of weight." In the same museum is a little enamelled beaker from Koft in Egypt, and described as Arab work; it is decorated

with fish in different positions, drawn in outline only with some freedom. By the twelfth century travels of Benjamin of Tudela, it would appear that glass-making in Syria was regaining its ancient importance. He mentions ten glass manufacturers at Antioch, and 400 Jews at New Tyre, "shipowners and manufacturers of the celebrated Tyrian glass." With more or less of romance he goes on to say that one wall of the great mosque of Damascus was made of glass by the Magi, and that it had "as many openings as there are days in the year, and that the sun in gradual succession throws its light into the openings, which are divided into twelve degrees." A further statement is that the Shah of Persia at that time had caused the body of the prophet Daniel to be placed in a coffin of glass at Susa. Coffins of glass seem to have had a fascination for mediæval writers. Modern explorers at Susa have not yet found this glass coffin, but the tomb of Daniel is still a holy place most highly revered by the wandering tribes, and who knows but that some day the find may take place? As, according to local tradition, the body of the Peighambar (*i.e.*, prophet) was 130 feet long and 30 feet broad across the shoulders, the coffin must have been of respectable proportions.

At St. Mark's, Venice, there is treasured a bowl of ancient glass of a nearly opaque turquoise colour. It is pentagonal, and has been roughly cut in relief; on the base are four Arabic characters signifying "God the Maker." It measures $8\frac{1}{2}$ inches across, and by tradition was a present from a shah of Persia in 1470, but the filigree setting, ornamented in cloisonné enamels, is of older date, and the piece is now ascribed to the tenth century. By the thirteenth or fourteenth century

Damascus seems to have become a great centre of glass-making, so much so that it was usual in mediæval times to speak of all glass from the East as "in the Damascus style." An inventory taken in 1380 of the possessions of Charles V. of France, mentions several vessels "*à la façon de Damas.*" On the sack of Damascus by Tamerlane in 1402, the conqueror carried back to his



SARACENIC MOSQUE LAMP (BRITISH MUSEUM).

Mongol capital "weavers of silk, men who made bows, glass, and earthenware, so that of these articles Samarcand produces the best in the world."

The glass lamps that formerly hung in the eastern mosques, will tell us the nature of the Damascus glass. There are six in the British Museum and

several at South Kensington, one of the latter (lent by Captain Myers) being exceptionally handsome, and bearing an inscription with name of Sultan Mohammed en Nasir ibn Kalaun (1293-1341). All are alike in shape, having a wide body, narrowed neck, and wide mouth. They are of blown clear glass, painted mostly in red, blue, and white enamels, finished in gold. Some at Cairo are pale green or blue; one is in deep blue. They were used with a little inner glass cup for oil and wick, and were suspended by metal chains which were fastened to several loops of glass on the shoulder of the lamp. Mr. Stanley Lane Poole mentions* that in 1883 he saw about eighty of these lamps still in the mosques at Cairo. They began to disappear so quickly, however, travellers being ready to pay a high price for them, that it was necessary to collect all the remaining ones and place them in the Museum of Arab Art. The main inscriptions vary but little, and consist of verses from the Koran. On one of the fourteenth century in the British Museum there is written on the body:—"By order of his excellency, the most noble, the exalted, the Lord, the master, Seyf-ed-din Skeykhū, of En-Nāsir, God magnify his triumph," and on the neck, the commencement of a verse:—"God is the light of the heavens and the earth; His light is as a niche in which is a lamp."

On another lamp of the fifteenth century, and marked on the handles—a few words on each—"Of what was made for the mosque at the grave of the lady Et-Takūna," the rest of the quotation may be found. "... and the lamp in a glass; the glass as it

* "Art of the Saracens in Egypt."

were a glittering star ; it is lit from a blessed tree, an olive neither of the East nor of the West, the oil thereof would well-nigh shine though no fire touched it—light upon light : God guideth to His light whom He pleaseth ; and God strikes out parables ” [for mankind, and God is mighty over all].

Occasionally the lamps bear the name of the painter or writer. The man who formed the shape was evidently not of much account. So eager have collectors of curiosities been to secure examples, that many forgeries exist, and genuine lamps are very valuable. One at South Kensington, of only moderate size, was purchased for £200.

A few other pieces of glass are known decorated in the Arab style. At South Kensington is a bottle seventeen inches high, the largest of its kind. It is of greenish glass decorated in red outline, now not very perfect, with medallions in red and blue. The cup at Breslau, said to have belonged to St. Elizabeth of Hungary, has an ornament of red enamel arabesques. The cup called the “ Luck of Edenhall,” is decorated in enamels in a similar style. “ Two bottles from Damascus,” are mentioned in the inventory of St. Stephen’s, Vienna, as long ago as 1373, and are still preserved there.

CHAPTER VI.

GLASS IN MEDIÆVAL ITALY.

IN the church of St. Mark's at Venice we may find a link between old and new. Planned as a Byzantine church, it did not receive its final touches until Gothic times, and the mosaics for which it is famous extend over a period of about 250 years. Upon the demolition in 829 by the Mohammedans of the church of St. Mark at Alexandria, the relics of the saint were acquired by the Doge of Venice, who, proclaiming St. Mark as the new patron saint of the Republic in place of St. Theodore, purposed the building of a cathedral to enshrine so great a prize. Portions of this first cathedral remain, but the greater part of the present building was erected by Doge Contarini (1063-1071), the decorations being commenced by his successor, Domenico Selvo. The wealth of the city was enormous, and the choice seemed to lie between spending the money on some expedition of conquest or on the church. Fortunately the latter was decided upon, and two or three centuries the work lasted, every vessel sailing for the East being bound to bring back precious marbles or carvings of some kind, so that, as regards its architectural features, St. Mark's is somewhat of a museum, work of all kinds, back to Roman, being built in.

The interior walls are finished after the pattern of St. Sophia ; costly marble slabs on the lower portions, mosaic on all above, including the arch soffits and spandrels, vaults and domes. The wonderful colour effects of these great spaces of mosaic have been eloquently described by Mr. Ruskin, who, indeed, seems to consider mosaic the only suitable material for permanent architectural colour decoration.*

Upon the vaults of St. Mark's may be read a whole Bible in mosaic. "Never had city a more glorious Bible," says Mr. Ruskin. Here might the unlettered read, in pictures that would never fade, of the great facts of his religion. In the outer portico or atrium, beyond which the catechumens might not go, were pictures from the Old Testament ; the history of the fall of man, of the patriarchs, and of Moses, the series ending significantly with the eating of the manna in the wilderness—type of the true Bread of Life. After admission to the Spiritual Church by baptism, the catechumen could worship within the cathedral itself. Above the doorway inside, he would see the picture of Christ enthroned, the Virgin and St. Mark on either hand, and in the open book held by Christ, the words "I am the Door." In the first cupola was represented the pouring out of the Holy Spirit at Pentecost, twelve streams of fire descending upon the twelve apostles. Below them, between the windows pierced through the dome, were figures representing

* Mr. G. E. Street, R.A., the architect of our new Law Courts, wrote : "The colour is so magnificent that one troubles one's-self but little about the architecture, and thinks only of gazing upon the expanse of gold and deep rich colour all harmonised together into one glorious whole. . . . Nothing but a soft swelling and undulating sea of colour is perceived."

the men of all nations present at Pentecost. On the four angles or pendentives were angels bearing tablets, three with the word "Holy," and the fourth with "Lord"; and between them encircling the dome, the rest of the words of the "Sanctus." On the section of the vaulting between the first and the second domes were represented the Crucifixion and Resurrection of our Lord, with several smaller scenes of Judas' betrayal, Pilate's judgment, the descent into Hades, the appearance of Mary Magdalene, and other incidents. Then in the second cupola—the one over the centre of the church—was represented the Ascension. In the highest space was the figure of Christ, borne up by four angels and throned on a rainbow. Beneath were the apostles as on Mount Olivet, and between the windows, the Christian virtues. Upholding all, in the four angles were figures of the four Evangelists. In the more distant dome over the altar, and not so readily seen from the body of the church, there was drawn a figure of Christ enthroned and surrounded by patriarchs and prophets. Thus the vaults along the main vista of the church were concerned with the principal tenets of our faith.* Over the side chapels were represented numerous subjects from the New Testament, embracing the life of our Saviour, incidents from Apostolic

* Mr. Street, speaking of the mosaics (in "Brick and Marble of the Middle Ages,") says: "It is worthy of notice that the most prominent figure in the whole church is that of our Blessed Lord, who, seated and surrounded by the twelve Apostles, is represented in mosaic in the principal dome; and I believe that their arrangement throughout the entire church is a lesson to those among ourselves who so often, in selecting Scripture subjects for representation in churches, do so without reference to their proper consecutive order or their relative importance."

times and from the visions of the Revelation. There is at South Kensington Museum a modern copy by Dr. Salviati, of a figure of Christ from St. Mark's. It is beardless; a white nimbus surrounds the head; the golden upper robe is outlined and shaded with red; the background is deep blue. At the British Museum there is a frame of mosaic fragments from the Baptistery at St. Mark's.

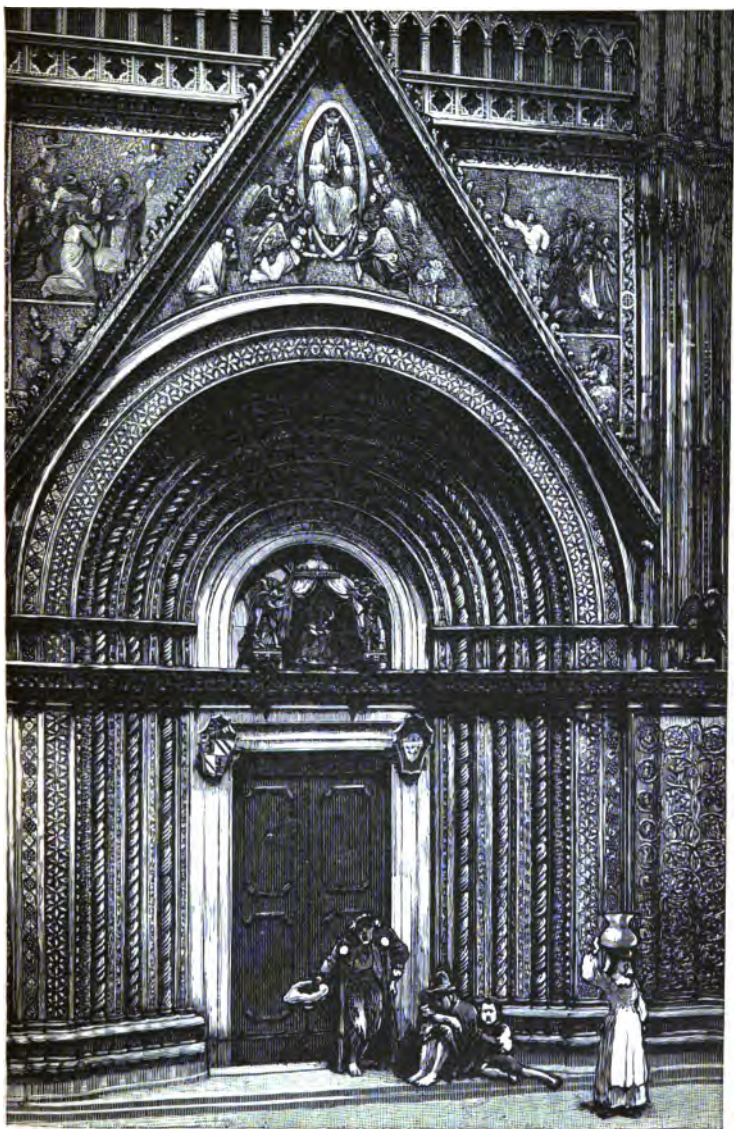
Such a huge enterprise as this of covering a whole cathedral with mosaic exercised an important influence upon the glass workers at Venice, who, until this time, do not appear to have been many in number. Mosaics had been fixed in the church of St. Cyprian at Murano in the ninth century—whether by Byzantine or Venetian workers is not known. It is not till the year 1159 that the name of one Pietro is mentioned as engaged on the mosaics for St. Mark's. Early in the next century the glass workers, or *phiolari*, were numerous enough to draw up regulations for the conduct of their trade.

Elsewhere in Italy, instances of mosaic working on a large scale do not seem to be numerous. In Sicily, the Norman cathedral of Monreale, commenced in the twelfth century, is entirely covered inside with mosaics, and the smaller Capella Palatina in Palermo has equally magnificent decorations. At Orvieto, the superb early Gothic cathedral has some well-known mosaics on the exterior. When, some time in the thirteenth century, the miracle of Bolsena took place, and the festival of Corpus Christi was instituted, the people of Orvieto determined to commemorate the events by the erection of a basilica after the fashion of Santa Maria Maggiore at Rome. In 1290 Pope Nicholas IV. laid the first stone, and thereafter for

some 300 years the works went on. The plan of the whole was due to Lorenzo Maitani, an architect of Siena. 152 sculptors, 68 painters, and 90 mosaic-workers were employed at different times, among the latter being Orcagna and Ghirlandajo. One of the doorhead fillings by Orcagna, representing the birth of the Virgin, is now in the South Kensington Museum, having been purchased in 1891 for £1000. One is tempted to ask two things: why was a work of art of this kind allowed to be removed from the edifice for which it was designed, and of which it had formed a part for over 500 years; and secondly, why was it purchased by the Museum authorities? Away from its surroundings, the mosaic looks quite insignificant, and literally, out of place.

In addition to the series of mosaics that fill the flat spaces of the front, the columns of the doorways have in several instances an inlay of mosaic in geometrical patterns, the glass being inserted in grooves half-an-inch or so in depth cut into the white marble, the columns being sometimes carved as if twisted. Such decoration was mostly employed for church purposes in screens, pulpits, tribunes, and other constructional features. The earliest specimen dates from about A.D. 580 in the tribune of the church of San Lorenzo at Rome. The tomb and shrine of Edward the Confessor in Westminster Abbey had mosaics of this kind, executed by "Peter, the Roman citizen," brought over by Henry III. in 1270 specially for the decorations of the rebuilt abbey. At the same time the famous pavement of marble mosaic—"opus Alexandrinum"—was laid down.

With the development of pictorial art in Italy, wall decorations in mosaic went out of fashion, and no



THE CENTRAL DOOR, ORVIETO CATHEDRAL. Google

works of importance appear to have been carried out after the fifteenth century.

But the glass-workers established at Venice began to be noted for their productions in ornamental glass, and from the thirteenth century onward a great quantity of beautiful work of all kinds proceeded from the City of the Adriatic. By the year 1291, so numerous had the factories become that the Great Council took fright at the possible danger of conflagration, and ordered all glass furnaces to be demolished within the city. Except that this was modified in the following year to the extent that small-ware makers might carry on their trade in Venice provided a space of fifteen paces was left around their works, the prohibition remained in force, and most of the establishments migrated to the island of Murano, a mile to the north. And still at Murano the glass furnaces glow, and the magical phantasies of Venetian glass are brought into being by descendants of the original "phiolari."

It is not surprising that very soon the Venetian workers—proud of their skill—endeavoured to have a close corporation. Already in 1295 they petition that a heavy fine should be imposed upon makers who should try to return to Venice after working in other places, Vicenza, Padua, Mantua, Ravenna, and Bologna; and twenty years before that date, it was found necessary to prohibit the sending away any sand or other materials for glass-making. There appear to have been four groups of workers: the "phiolari" for vessels and windows; the "cristallai" for optical glass; the "specchiai," or mirror makers, and the bead makers. Of these last, there were the "pater-nostreri," who made rosaries, "margaritai" who made

small beads, and "fuppialume" who made large blown beads. These all had their guilds or fraternities, and so highly was the craft esteemed that its members were to be considered "gentlemen," and no nobleman marrying into a glass-maker's family was dishonoured thereby. Any workman who dared to carry the art to another country was, after due warning, liable to be tracked and slain, and it is recorded that instances of this punishment did occur. A wandering glassmaker named Paoli had found his way into Normandy, with his daughter, but having been traced by emissaries was found dead one day, stabbed to the heart with a dagger on which was written "Traitor." Admission to the works was jealously guarded; strangers were never allowed within the gates. Each apprentice had to pass a severe examination before proceeding to the status of master, and the state officials who exercised a strict scrutiny of all that went on, saw that there were no more masters than necessary. No master could engage a workman unable to produce his discharge from his former employer, or who owed anything. At the same time, although admission to the craft was difficult, honourable retirement was easy; if, after ten years' work, a master could not pay his way, he could claim a pension of seventy ducats from the guild.

The earliest piece of Murano glass still preserved is a marriage cup in the Correr Museum at Venice; it is ascribed to a maker named Beroviero of about the year 1440. It is made of blue glass, with portraits of a man and woman painted in enamel. There is a similar cup in the British Museum which cost Mr. Slade £161, and one of the same shape, but with an indistinct decoration of swans which, bought

from the Castellani Collection at a cost of £360, 10s., is at the South Kensington Museum. It does not look worth it, most certainly. Near it is a much better specimen in green glass, with the usual pair of marriage portraits, and this cost £30.

The Berovieri were a distinguished family. Marino Beroviero was master of the company of "phiolari" in 1468. His father, Angelo, had an apprentice, Giorgio, nicknamed *il Ballerino*, who earned an unenviable fame by copying the receipt-book of his master, and selling the secrets to another maker. With the money thus gained, he himself started a workshop, and so founded the house of the Ballerini. An account of Venice written about 1495, by Sabellico, mentions the street of Murano as extending a mile in length, and illustrious on account of its glass-houses. "Hence come cups, beakers, tankards, caldrons, ewers, candlesticks, animals of every sort, horns, beads, necklaces; hence all things that can delight mankind; hence whatever can attract the eyes of mortals; and what we could hardly dare to hope for, there is no kind of precious stone which cannot be imitated by the industry of the glass-workers. Hence come vases, the equals of the murrhine, unless cost may be a source of pleasure. But consider to whom did it first occur to include in a little ball all the sorts of flowers which clothe the meadows in spring." The mention of murrhine brings to mind the Roman glass of mixed colours of which the secret had been lost. It was rediscovered by Cristoforo Briani and Domenico Miotti, and the work produced in glass of this kind became extremely varied and interesting. Some of the colourings are as good as any of Roman workmanship, while the shapes are graceful and appropri-

ate. Among the numerous examples at the British Museum, one ewer in especial is worth notice; the marbling is in rich greens, yellow, and purple.



VENETIAN GLASS EWER.

Another rediscovery made at Murano, was the method of making the lace or reticulated glass—*vitro di trina*. In this the Venetian artists were extremely happy, and the delicate and fanciful forms, made readable and expressive by the light threads of white or coloured glass embedded in the clear mass, have always excited admiration. Perhaps in these two

classes, the marbled (or *schmelz* as it is often termed now) and the lace, Venetian glass is at its best. Some of the transparent colours used by the Venetians are not wholly pleasing in tone, the blue especially; where they employ no colour at all, utilising merely the contrast between a colourless transparency and a white opaqueness, the most delicate of effects is generally obtained.

Apart from the simple and obvious forms of cups and goblets, Venetian taste seems to have run towards the bizarre. The very facility of the ware—or rather the dexterity of the artist—seems to have prompted an indulgence in the extravagant and grotesque, which is not always justified by the artistic result. Bulky bodies balanced on the tips of dolphins'



VENETIAN GLASS CUP, "VITRO DE TRINA."

tails, boat-shaped vessels perched up on a bewildering erection of tubes and birds and nondescript griffins, full-blown flowers filling the whole of the bowl of a closed vase—these excite surprise at the ingenuity and daring of the craftsman, but do not impress one with the fineness of his taste. One or two exhibits at the British Museum are really deplorable. There

is a trident about four feet in length, all of hollow glass, with little turquoise bosses stuck on the prongs. There is a vessel in the form of a human foot and lower leg. There is a set of knife, spoons, and fork with twisted handles. But for the tall and graceful spill-vases, the drinking-cups on elegant twisted stems, the tankards and tazzas with bossed or fluted sides, and the countless other variations that were obtained, no words of praise can be enough.

All through the Middle Ages the fame of Venetian glass was great, and if the workmen could not be enticed away, as was frequently attempted, the next best thing was to buy largely of the Venetian merchants. As early as 1399, we find Richard II. giving permission to the masters of two Venetian galleys lying in the port of London to sell their glass vessels on board, duty free. In an inventory, taken in 1542, of property belonging to Henry VIII. and under the charge of Sir Anthony Denny at the palace of Westminster, nearly 450 articles of glass are mentioned. Among them we read of "great glasses like bolles standing upon fete," "great bell candlestickes," "aulter candlestickes," a "hollywater stocke with a bayle," a "leyer of blew glasse partly gilt, the leyer having the Kinge's Armes gilt upon it," glasses with "long smale neckes and great bellies," and a "baskett with two eares."

A favourite conceit was the making of "puzzle" and "wager" cups. These assumed various forms, alike only in the idea that the contents of the cups had to be drunk without the spilling of any portion. In some there were arrangements of syphons which, unless the trick were known, would discharge the contents anywhere but in the drinker's mouth. A

quaint form was the "windmill" cup, in which, instead of an ordinary stem and foot, the glass was finished with a little model of a windmill in metal. The glass could only be set down when empty by reversing it. Attached to the model was a tube which directed a stream of air against the sails and caused them to revolve. Bibulous wagers would be laid as to the drinker's ability to go through the following performance: Set the sails revolving by a vigorous blast through the pipe, fill the cup to the brim, drain it to the last drop, and set it, reversed, upon the table again before ever the sails ceased their revolutions. One of these windmill goblets can be seen in the British Museum.



A WINDMILL CUP.

A prodigious quantity of beads of all kinds came from Venice for exportation to the East. Wherever the trade of the Middle Ages could penetrate, there we may find Venetian beads also. Far away among African and Indian tribes, old Venetian beads are still found—older beads even than these, perhaps Phœnician and Egyptian. An instructive contrast may be seen in a case at the Geological Museum; side by side are some beautiful old beads of solid opaque glasses in quiet harmonious colours, and some modern slave-trade patterns, glittering and vulgar with gold and cheap enamels. An idea of the importance of the bead industry may be gained from the fact that in 1764 twenty-two furnaces were devoted to it, producing about 44,000 lbs. per week. From 600 to 1000

workmen—the “fuppialume”—were employed at the blow-pipe alone upon the ornamentation of beads.

In addition to the manufacture of beads, the canes of opaque or transparent glass were also, of course, used for the smaller kinds of mosaic. There is, for instance, at the British Museum, a curious canopy or wall decoration of glass dating from about 1700. Upon a wooden foundation, a mass of leaves and flowers of Oriental type has been set; on the overhanging ceiling are the sun, moon, and stars, and, just below, a white dove. It has been suggested that the work may have been executed by nuns, possibly in Sicily. At South Kensington there is an interesting spinet or virginal which was made at Murano about the end of the sixteenth century, and is said to have belonged to Elizabeth, Queen of Bohemia, daughter of James I. Whatever may have been its value as a musical instrument, it forms a pretty piece of colour as an article of furniture. Its stamped and gilt leather-covered case, once of a royal crimson but now faded to a brown, hides a gorgeous interior, panelled out in compartments containing representations of Daphne, Andromeda, Narcissus (*sic*), Io, Argus, and so on. There are eighteen of these divisions on the folding-lid; elsewhere, the sounding board, the stretcher bar, the sides, the front of keyboard, and the keys themselves are covered with ornament in coloured glass, silver, and enamel. The accidentals have a top of blue and white striped glass, and the fronts of the naturals short lengths of the same. Beads and buttons of pearl are powdered plentifully about, and altogether it looks very gay and useless.

The making of mirrors would seem to have come into Venice from Germany. The first mention of them is in 1317 when a petition records how a certain "magister de Alemania," a mirror-maker, had broken his agreement with three Venetians, and departing had left on their hands a great quantity of alum mixed with soot, and what could they do with this but sell it, although such sale was forbidden—hence the petition. In 1507, Andrea and Domenico dal Gallo obtained an exclusive privilege for twenty years in the making of mirrors for which they now possessed the knowledge, the secret having hitherto been in the keeping of only one German glass-house. The "specchiali," or mirror-makers, established their "scuola" or guild in 1569. The test of membership was to flatten and polish a sheet of glass, and to apply the "foglia" or leaf of reflecting metal. The glass was blown in cylinders, cut, opened out, and polished on a table. For two centuries the Venetian mirrors were exported in large numbers—in 1664, it was estimated that the value of those sent to France was about 100,000 crowns annually—and then competition abroad led to the downfall of the trade. One of the last of the makers was Giuseppe Briati, an enterprising man who, finding how seriously his business was affected by the Bohemian makers, worked for three years in a Bohemian glass-house in the disguise of a porter. When he returned in 1736 and obtained a patent to make glass in Bohemian fashion, his jealous Murano neighbours would not hear of it, and he had to migrate into Venice itself. He was famous for mirrors with frames of glass as well as for light table ware, and while he could make lustres six or seven feet in diameter,

he was equally successful with the smallest pieces of "*vitro di trina*." After his death in 1772, the glass trade seems to have fallen very low, and by the beginning of this century only a few bead-makers kept their furnaces going.

Not wholly to expire, however. One or two expert workmen remained to avail themselves of the instruction and enthusiasm of the Abbé Zanetti, who about the middle of this century founded a museum at Murano, and began the re-discovery of the chemical and technical processes employed in the ancient examples. About 1858, it became necessary to restore some of the mosaics in St. Mark's, and Radi, a descendant of one of the old Murano families, offered to do the work. Dr. Salviati, a lawyer, joined Radi in the enterprise, and their united energy and learning brought back to Venice some of its ancient reputation. Salviati's glass began to be known in other countries, and a company was eventually formed with English capital in 1866 to the management of which Dr. Salviati was appointed. The new works were built on the Grand Canal in Venice, and there a large staff of skilled workers was gradually got together and trained by old Radi, the forgotten processes of antiquity being one by one striven for and rivalled.

A change in the management of the company led to Salviati's withdrawal, and it was reconstituted as the "Venice and Murano Glass Company," while Salviati founded a fresh establishment. From both sets of workshops have proceeded original works of extreme beauty of colour and excellence of workmanship, as well as reproductions of some of the celebrated works of antiquity. The Phœnician and Egyptian

opaque bottles have been imitated, some seventy different pieces in the British Museum having been copied by the Venice and Murano Company. Their workmen also have copied the pierced silver goblet, and reproduced the glass-enamelled Arab lamps. Finally they have attacked the cameo work in the style of the Portland Vase, and in 1887, exhibited a little cup of blue and white glass, which had taken eight months to engrave.

To Dr. Salviati has fallen the enviable distinction of supplying pictures in mosaic for a large number of English cathedrals and churches. We need mention only the picture of the "Last Supper" over the altar at Westminster Abbey, and the mosaics on the Albert Memorial, London. He introduced a method of working the mosaic upside down upon paper and of backing it with cement in slabs of portable size, which could be packed and sent abroad to their destination. The old mosaics were of course worked on the spot they were to occupy, a certain portion of the wall or vault being covered with cement, into which the cubes of glass were pressed one by one, the irregular alignment and levelling thus obtained being really of no detriment to the effect but rather helping it by breaking up any flat masses of colour or great spaces of gold. To this extent, Salviati's plan, though adopted now by most mosaicists, is defective; the finished surface is too flat, and the gold grounds too uniformly level and glassy. An extraordinary variety of colours is now used by the Venetian workers; somewhere near 37,000 colours and 400 shades of gold are in stock at the works of the Venice and Murano Company, and without doubt Salviati uses as many.

Some amount of mosaic is produced at Rome, but it is of a kind that interests us but little. For the most part it seems to be used in imitation of painted pictures, the minutest shades and details being slavishly copied with microscopic accuracy. The little pictures set in brooches and trinkets make one's eyes ache to look at, and one's mind shrink at the labour imposed upon the workman, and all to a mistaken purpose. For why should one expect from a mosaic made up of separate squares of colour, whatever their size, a pictorial treatment which can only rightly be given by the brush, with its power to blend and soften the colours together? Mosaic demands large spaces and a distant view to reveal its characteristic and jewel-like glitter. A mosaic of comparatively few colours, but those rightly disposed, will produce a finer architectural effect than one in which thousands of shades of colour have been introduced. In the latter case the impression received by the eye will be blurred and uncertain; in the former, it will be sparkling and vivid. A well-known artist-engraver commissioned to reproduce in wood-engraving the masterpieces of Italian art, writes thus: "The mosaics in Ravenna are the most surprisingly magnificent things I ever saw. Nothing could excel these beautiful mosaics in delicacy and brilliancy of colour; as delicate as a breath, and sparkling like an array of tinted gems. I am seated before the procession of the twenty-two virgins and the magi bearing crowns and gifts to the infant Jesus, who is seated on the Madonna's lap with two angels on each side. The background is gold, delicately shaded with light and dark brown tints. With my opera-glass I can see the separate stones; but without it, and at a proper dis-

tance, the tints blend, and the twinkling bespangled effect of the whole is very pleasing."*

Although one cannot help thinking that the Roman idea of mosaic is mistaken, it ought to be acknowledged that had it not been for the pontifical manufactory the art might almost have been forgotten. To



MOSAIC PICTURE PRESENTED BY THE POPE.

Pope Urban VIII. (1623-1644) was due especially the idea of perpetuating in the imperishable materials of mosaics the failing oil paintings and frescoes in

* Mr. T. Cole in the *Century Magazine*. The figures referred to are in the church of San Appollinare Nuovo.

St. Peter's, and since his time the Vatican studios have held a monopoly for this kind of work. Among the Jubilee presents to the Queen in 1887, we may remember the gift of His Holiness the Pope. It was a reproduction in mosaic of Raphael's fresco of "Poetry," and it was really very delicate and fine in workmanship.

It is significant that in Rome itself, the scene of the first efforts of Christian art, an English artist should now be entrusted with the task of designing a great scheme of mural mosaic decoration. Sir Edward Burne-Jones in his beautiful designs for the new church of St. Paul's-within-the-Walls, built under the direction of G. E. Street, R.A., has evidently been inspired by the Roman and Ravenna mosaics of the fifth and sixth centuries, although in the details of the figures he retains his characteristic and somewhat melancholy type of design. The mosaics are being executed by the Venice and Murano Glass Company. In the composition to be placed over one of the arches, with the subject of the "Tree of Life," and in the extremely dignified decoration of the apse, Sir Edward's genius is displayed at its best. Adopting in the latter the idea often seen in the old basilicas, he represents in the centre Christ seated in glory with one hand raised in blessing. Around His head are innumerable angels, and from under His feet gush out four rivers of living waters. To right and left are tall figures of archangels, each standing in front of a doorway in the golden wall of the New Jerusalem. There are six doorways, but only five archangels. With an eloquent silence, the doorway at Christ's right hand is closed and dark. Its guardian was Lucifer, now fallen from his high estate.

CHAPTER VII.

GLASS IN GERMANY AND FRANCE.

GERMAN ornamental glass is characteristically different from that of Venice. More sturdy, and robust even to clumsiness, more rough in workmanship, but with no lack of spirit, less choice in colour, but with certain broad effects of its own, the German work has several points of interest. As to its early beginnings there is some uncertainty. From the amount of glass found in the neighbourhood of Cologne and Treves—early Roman stations—it is thought that the making must have been carried on in Roman times. Drinking vessels of glass are not uncommon in graves of the period soon after the Roman occupation. In Italy, glass of mingled Teutonic and Byzantine feeling has been found. There are, for instance, in the British Museum, two vases and a drinking horn which, from the circumstances of their discovery, point to an early Teutonic origin. The horn is about nine inches long, of blue glass, with thin trickled lines of white glass surrounding it. The vases are of green glass into which rough splashes of red, white, and yellow glass have been melted. The handles and a spiral line round the necks are in green glass. Two bowls (also in the British Museum collection) were discovered in

a grave at Leuna, near Merseburg (Prussia). They are of clear glass, and appear to have been finished by cutting and engraving ; one has a figure and stags upon it, perhaps a representation of Actæon. These show some remains of Roman influence ; they were, however, found with some decidedly German bronze work. Near these we may see a large and handsome drinking horn of yellow transparent glass (now slightly iridescent) ; this was found in a German grave at Bingerbrück on the Rhine.

An interesting notice of glass-making in Germany at an early period is in a letter addressed by one of our early abbots, Cuthbert of Wearmouth, about the middle of the eighth century, to Lullo, Bishop of Mainz : "If there be any man in your diocese who can make vessels of glass well, pray send him to me ; or if by chance he is beyond your bounds, in the power of some other person outside your diocese, I beg your fraternity that you will persuade him to come to us, for we are ignorant and helpless in that art ; and if it should happen that any one of the glass-makers, through your diligence, is permitted (*D.V.*) to come to us, I will, while my life lasts entertain him with benign kindness." If the worthy abbot could have looked into futurity he would have seen, not very far away from his quiet little monastery, the huge glass-works of modern Sunderland.

Although it is possible that glass-making continued in Germany, no very definite references to the matter exist, and the oldest date that so far has been found on glass is that of 1553, on a specimen at Berlin. The oldest dated piece at the British Museum is of the year 1571 ; it is a large cylindrical

drinking-vessel of the kind called *Wiederkom* (or, "Come again"). It is of clear glass, painted in enamels with a large Imperial eagle, bearing on its wings the coats-of-arms of states and towns composing the empire. These glasses are not very graceful in form, but they are eminently business-like, and the suggestion of good fellowship in their descriptive name is borne out by their huge proportions.

A traveller in Germany in 1687, gives a good idea of the arrangement of these vessels; he says: "You shall also know that glasses are as much respected in this country as wine is loved; they are paraded everywhere. Most of the rooms are wainscoted for about two-thirds of their height, and the glasses are arranged all round on the cornice of the wainscot, like the pipes of an organ. They begin by the little one, and end by the great, and these great are melon-glasses (*cloches-à-melon*), which one is obliged to empty without pausing when any health of special importance is to be drunk."

At South Kensington is a "*wiederkom*" of the year 1671, which may be described as typical of this domestic conviviality. It is a plain cylinder about $9\frac{1}{2}$ inches high. On it are painted in enamel, portraits of a miner of the Hartz Forest, and his wife, with an inscription relating the perils and heroisms of the husband's calling. He is all in black, except for his white buttons and under-sleeves, and he carries a long-handled yellow axe. The lady has a black hood, white collar and cuffs, and a skirt half white and half black. She is raising her glass with a grandiose air, or else expressing surprise at its emptiness—one cannot be sure which. Two other glasses at Kensington may be mentioned; both are

beakers, and decorated in enamel colours; on one, a lady and gentleman are again depicted with an inscription in white:—

“Lieb haben inn ehrn
Kan mir niemandt wehrn,
1599.”

(“No one shall prevent my holding love in honour.”)

The other, which is of dark blue transparent glass, has a date in two instalments; the figure 1, then a piece of ornament, and then the remaining figures 601. The ornament represents a sportsman kneeling and taking aim with a blue and yellow gun at a red stag with yellow antlers. The stag does not seem in the least alarmed.

A very characteristic and effective feature in some old German glass is the use of drops of glass placed in regular diagonal order, and each drawn out to a more or less blunted point. The light plays in and out of these protuberances in the happiest way. The more simple the art, the better the effect, as far as German glass is concerned. Another form of frequent occurrence is the so-called “flügelglas,” probably suggested by Venetian work. This is a goblet set upon a high stem, with wide-spreading ornamental scrolls to right and left. They are often very interesting and picturesque. Eventually, the use of enamel decorations tempted the artists to indulge in more pictorial designs, and after producing some elaborate processions and battle subjects (one in the British Museum, dated 1662, represents a procession in honour of the birth of Maximilian Emanuel, afterwards Elector of Bavaria), the method could not be further elaborated, and died out. Then came the clever but ineffective engraved glass. One

recognises the skill of Johann Schapper, for instance, who produced ornamental engravings of such extreme delicacy of execution that they seemed "merely like a cloud on the glass." But were they worth doing?

About the year 1600, Bohemia begins to be mentioned for its crystal glass, and Caspar Lehmann, for his ingenuity in cutting the material. It used to be claimed for Lehmann that he invented glass-cutting, but that is clearly incorrect, for, as we have seen, very valuable examples of the process exist from ancient times. He was appointed, about 1609, lapidary and glass-cutter to the Emperor Rudolph II. From his workshop at Prague came two or three scholars, among them George Schwanhard, who migrated to Nuremberg and Ratisbon, and left two sons, George and Henry, to carry on the art. They seem to have used both the lapidary's wheel for



GOBLET REPRESENTING PROCESSION IN
HONOUR OF MAXIMILIAN
(BRITISH MUSEUM).

cutting, and the diamond for etching. Henry Schwanhard, about 1670, discovered a method of etching on glass by fluoric acid, the ground being eaten away and dulled, while the ornament remained smooth. He is said to have been led to this idea by noticing how his spectacles had been spoilt by being accidentally touched with acid. Contemporary with Schwanhard, Hermann Schwinger was also working at Nuremberg. There is a piece of his work in the British Museum. Shown with it are a few specimens of Dutch engraved glass, by Greenwood, Adams, and Wolf, and some of the curious cypher-engraving—long swirls and flourishes, very graceful in line, and suggestive of the old writing-master's accomplishments—by W. von Heemskerk, of Leyden, about 1675.

Ruby glass was brought into prominence by Kunckel, the director of the Potsdam glass-works, about 1680. The intensely strong colour was obtained from gold, a thin layer only being sufficient to give a full colour. A very ordinary way of utilising this "flashed ware" (clear glass coated with a coloured glass), was to cut through the colour into the clear substance. In this way the thin film of colour is irradiated by the light striking on the cut facets. Bohemian glass is largely imported into this country; most of it seems to be rather over-decorated. Lobmeyr, of Vienna, has for many years excelled in the manufacture of glass, especially in engraving and cutting.

To turn now to France. Here too the oldest glass dates from Roman times. The name of Frontinus occurs on a barrel-shaped bottle of greenish glass, found at Amiens, and now in South Kensington Museum; it dates from the second or third century. In the Comarmond Collection at the British Museum

are numbers of little flasks in transparent glass of different colours; these are relics of Roman France. Occasional references to glass occur during Merovingian and Carolingian times, and in the province of Poitou there seems to have been an organised industry from quite early times. In 1466 it is recorded that in payment for permission to collect fern, the glass-workers at La Ferrière gave the abbess of the Holy Cross at Poitiers, twelve dozen glasses and one dozen ewers. In 1572, Fabriano Salviati, a gentleman of Murano (bearing a name to be afterwards made famous), settled in Poitou, and whether due to his influence or to others, ornamental glass in Venetian style began to be made there. In Provence and Normandy also, glass-houses were at work in the thirteenth century. The "Boucault" drinking cup of yellowish glass, in the British Museum, is attributed to some manufacturer of Provence; it is painted in enamels, and the costumes of the figures give it a date of about 1520. It bears the names of Jean and Antoinette Boucault.

As early as 1490 the French glass-makers had a prescriptive right to the style of "gentilhomme," in this respect being as well favoured as those of Venice. These privileges of "noblesse" were jealously regarded at all times, and remained in force up to this century. Many an impoverished Huguenot gentleman took to glass-making as a trade that did not disgrace his rank. As late as 1746 more than forty "gentils-hommes verriers" of one town in Gascony were sent to the galleys for professing the principles of the Reformation.*

* Readers of Du Maurier's "Peter Ibbetson" will remember the charming episode of "la belle Verrière" and the old glass-works at Verny le Moustier.

A very celebrated Huguenot, Bernard Palissy, the potter, may be mentioned in connection with the art of glass. Of course the full story cannot be told here of his heroic struggles to acquire the secrets of coloured enamels (*i.e.*, glazes) for pottery. He says himself in an often-quoted autobiography, that it was because his real trade of glass-painting was falling off that he turned his attention to the closely related study of ceramics. As a young man he combined the work of a glazier and painter upon glass with the duties of a surveyor. Before marrying and settling down at Saintes he had travelled all over France, and visited Germany and the Low Countries, acquiring all kinds of useful information in the natural sciences. His thoughts were frequently turned to the subject of pottery, and it seems that only a slight cause was needed to induce him to devote his whole attention to it. "An earthen cup," he says, "was shown to me turned and enamelled of such beauty that henceforth I entered into dispute with my own thoughts, bringing to my memory several jesting proposals that some had made me when I was painting images" (*i.e.*, for windows). "Now, seeing they were beginning to give them up in the country where I lived, and also that glazing was not in great request, I thought that if I could discover the invention of making enamels I should be able to make vessels of earth and other things of beautiful arrangement, because Heaven had given me to understand something of painting; and thenceforth, without considering that I had no knowledge of argillaceous earth, I set about seeking enamels like a man who gropes in the dark."

Palissy "groped in the dark" for some sixteen years before he arrived at any degree of success in

making his enamels—a signal instance of perseverance finally overcoming most depressing difficulties.

Persistent efforts were made from time to time by the French to obtain the assistance of Italian glass-makers. In the sixteenth century Henri II. established Theseo Mutio at St. Germain-en-Laye. In 1598 two “gentilshommes verriers,” Vincent Basson and Thomas Bartholus, natives of Mantua, obtained permission to establish themselves at Rouen, in order to make “verres de cristal, verres dorés emaulx, et autres ouvrages qui se font à Venise.” In 1603 Henri IV. established works at Paris and Nevers. In 1664 Colbert, the famous chief minister under Louis XIV., and generous patron of arts and sciences, wrote to the French ambassador at Venice, the Bishop of Béziers, asking him to obtain workmen for glass-making. The ambassador replied that if it were known that he had done so he ran the risk of being thrown into the sea. However, in the following year, eighteen Venetian glass-makers were bribed and brought to Paris, where they began making mirrors for the palace of Versailles and elsewhere. Four years later Colbert forbade the importation of Venetian mirrors. But the foreigners were discontented, troubles arose, and it looked as if the enterprise might come to nought, when Colbert learned that another mirror factory was in existence at Tour-la-ville, near Cherbourg, under Richard Lucas, Sieur de Nehou, where some men from Strasburg had introduced a knowledge of the manufacture, having acquired it surreptitiously at Venice. The two factories were united, and with royal patronage Lucas de Nehou produced looking-glasses that rivalled those from Venice. In 1688 the exclusive

privilege, for thirty years, of making large plates of glass *by casting* (all previous glass plates having been produced by blowing, and therefore limited in size),



CAMEO VASE—MODERN FRENCH.

was granted to a certain Abraham Thevart. It is said that this name was only assumed by a syndicate

formed to develop the ideas of the real inventor, Louis Lucas de Nehou, nephew of Richard. Over the door of the chapel at Gobain in Picardy is an inscription stating that Louis Lucas de Nehou invented in 1691 the method of casting glass, and installed the manufacture in 1695 in the chateau of Saint Gobain, where he died in 1728. The works are to this day among the largest in the world.

The establishment of the Gobain works gave France the monopoly of the trade, and for nearly 100 years after plate-glass was only to be obtained from the French makers. Then some English works were started at Ravenhead, in Lancashire, and we began to make our own plate.

Of the old ornamental glass of France not many specimens can definitely be determined. There was evidently no marked distinctive style. Of late years some extremely beautiful glass is being produced at Nancy by Emile Gallé and Messrs. Daum, in which novelty of technique is very marked, and an attempt made to get away from mere patterning in the design. Some of Gallé's poetic fancies are almost too fanciful, but that is a fault on the right side. There is too much mechanical art perpetrated now-a-days, and it is refreshing to find something original and thought-compelling. Monsieur Gallé seeks to amalgamate poetry and design, and his innovations have been welcomed in official circles, a case of his work finding a place in the Luxembourg Gallery in Paris.

CHAPTER VIII.

GLASS IN GREAT BRITAIN.

THE origins of glass-making in Great Britain are extremely uncertain. Some antiquaries go so far as to say that no glass was made here before the sixteenth century, and that all that was in use earlier than that date was imported. This assertion seems almost too sweeping, for it is difficult to believe that the large number of specimens found, of all periods, could all have been brought from abroad. The finding of beads will prove very little, for they are easily carried from country to country, and among nations not very far advanced in civilisation were largely used in barter. The "aggry beads," for instance, found in old graves on the Gold Coast of Africa, and valued at their own weight in gold, were certainly not made there, and remain probably as the sole record of some long past trading with Egyptians or Phœnicians. Beads, however, have been found in British graves, and how they came to be there must be left for students to discover. Within a stone-sided grave uncovered in a tumulus near Tynwald Hill in the Isle of Man, some glass beads were found, together with metal ornaments and iron weapons; these seem to betoken a great age. In British barrows or funeral mounds, in Roman graves,

in the tumuli of the Saxons, have been found beads of mixed opaque glass of the Phœnician type, and these, it is quite conceivable, were obtained from the Phœnician traders. They have been called "Druid's beads," "snake stones," or "Glain Neidyr" (holy snakes), sharing these fantastic names with the *adder-stones*, which used to be carried as charms against snake bites and other wounds. They were believed to have been produced actually by a party of snakes laying their heads together and hissing merrily, until the foam produced was turned into stone.

We have already mentioned that glass of Roman times has been found in London excavations. Similar remains have been discovered in many other places in England. It is possible that it was all imported, but it may reasonably be conjectured that, as in the case of pottery, while the finest ware was brought from abroad, the commoner kinds were made here, either by Roman potters or by Britons trained by Romans, so with glass. It may not have been worth while to make the more elaborate coloured glasses here, but it certainly was to make the commoner bottles and window glass, for which all suitable materials could easily be found. In 1860 the remains of a glass furnace were found at Buckholt, near the Roman road from Winchester to Salisbury, and many fragments of glass—green, blue, purple, and white—were found. At first it was thought that here had been a Roman furnace, but investigation of the fragments showed that, while some might be Roman, others were certainly of the time of Elizabeth or later. At Colchester, an important Roman station, among the numerous sepulchral remains, a cup (now in the Anglo-Roman room at the British Museum) was

found with a representation of a chariot race. This may perhaps have been made locally—there were evidently proper materials for doing so, for in 1295 and 1300, two glass-makers are enumerated among the jurors of the town, and were presumably persons of importance.

Of the glass of Saxon times, there are numerous



SAXON GLASS DRINKING-CUP (BRITISH MUSEUM).

specimens. In Kent, especially, drinking vessels have been found in large numbers. So many were dug up some years ago at Wodensborough that, in ignorance of their value, they were used in a neighbouring farmhouse as ordinary beer glasses. For the most part,

these Saxon glasses are of simple forms, long flasks or beakers, with either rounded bases or such small feet that they are veritable tumblers, and cannot be made to stand upright. The decorations—such as they are—are formed by threads of glass, arranged in spirals or irregular diamond shapes.

We have already mentioned the application from Abbot Cuthbert of Wearmouth to the Bishop of Mainz for a maker of glass vessels. Eighty years before this (about A.D. 675), some French workmen are recorded to have gone to Wearmouth to make windows for the same monastery. Glass windows, however, were not in general use till the fifteenth century, and even then the English manufacture does not seem to be too highly esteemed, for in 1447 John Prudde of Westminster, employed to make some windows for the Beauchamp Chapel at Warwick, covenants to use *no glasse of England*.

It was a long while before table glass was much used in England. Vessels of wood, or leather, or coarse glazed pottery, served our rough and ready forerunners. Here and there, however, a manufactory of glass was in existence. We read of one in 1557, when Thomas Charnock, in his "Breviary of Philosophy," says :

"As for glass-makers, they be scant in the land,
Yet one there is, as I do understand,
And in Sussex is now his habitation,
At Chiddingsfold he works of his occupation."

This would seem to be the same maker as he who is referred to when in 1574 the Bishop of Chichester writes to Lord Burghley that "of very late, aboute Petworth, certayne had conference to robbe the Frenchemen that make glasse, and to burne there

houses, but they be apprehended and punished." A century later Fuller states that "coarse glass-making was in this county (Sussex) of great antiquity." Camden, writing (1610) of the iron and glass industries of Sussex, says: "Neither want here glasse-houses, but the glasse there made, by reason of the matter or making, I wot not whether, is likewise nothing so pure and cleare, and therefore used of the common sort onely." [The maps of the counties in Camden seem to indicate two glass-houses, one near Dunsfold in Surrey, and the other nearer Rudgwick, in Sussex; it would be interesting to know if there are any traces of these old works now.] It is not surprising that "Venice glasses" were preferred to the "green ones blown in Sussex," however "profitable to the makers, and convenient to the users thereof," the latter may have been.

Now and then a Venetian galley would bring a cargo of glass wares, which would be acquired by the well-to-do, and mounted in gold or silver: Such were probably the pieces belonging to Henry VIII. In 1529 "a great glasse" was purchased for the king for 53s. 4d., and the year after, another "glasse" for 45s.—sums equal, perhaps, to twenty to twenty-five pounds now-a-days. In the inventory of goods at Kenilworth, in 1588, belonging to the Earl of Leicester, are included "tenne glasse dishes, gilte with the sinque-foyle on the brims, eight graven dishes of glasse aboute the brim, three dozen and four dishe glasses, two glass ewers, and twelve beare glasses, three with covers."

Efforts were naturally made to engage Venetians to carry on their business here. We have already seen how severely the authorities at Venice viewed

any attempt to rob their city of the monopoly. Their displeasure seems to have followed a party of eight glass-makers of Murano, who in 1550 sent a petition from London, praying to be excused from the penalties denounced against them. The unhappy men, not being able to obtain work at Murano, had accepted a sum of money to go and work in Flanders and England ; they had been seized and imprisoned in the Tower, and kept on bread and water, then released, only to be held in custody and in fear of the gibbet, till they should have worked out the value of the money that had been advanced them. The Venetian Council of Ten, anxious not to anger our English sovereign, thought that under the circumstances the men might remain here for the term of their engagement. It is possible that these were the makers referred to by Stow, who writes that "the first making of Venice glasses in England began at the Crotchet Friars in London, about the beginning of the reign of Queen Elizabeth, by one Jacob Vessaline, an Italian." He also records that the Fryar's Hall, which had been converted into a glass-house, was, with 40,000 billets of wood, burnt down in 1575. In 1580, Queen Elizabeth granted a fresh patent to a Venetian for making Venetian glass in Crutched Friars. We learn that owing to the representations of some fifty persons, then belonging to a London Glass-Sellers Association, the patent limited the sale of the foreigner's wares to his own works. In 1565 a Cornelius de Lannoy is mentioned as making experiments for Sir William Cecil, apparently, for want of good crucibles, without much success ; "the potters cannot make him one pot to content him : they know not howe to seasson their stuff to make the same to

susteyne the force of his great fyers." Two years after, Pierre Briet and Jean Quarre obtained permission to make "table glasse as is used here for glasing, brought hither out of Burgundy, Lovayn, and France," and in 1568 asked leave to cut wood and make charcoal in Windsor Park. Other Flemings, Protestant refugees, also came over and started window-glass works in London, Stourbridge, and Newcastle-on-Tyne, and in 1614 Bernard van Linge, a celebrated glass painter, began to work here. In 1589 George Longe, petitioning for letters patent, states that there were fifteen glass-houses in England.

What with our numerous iron foundries and the growing importance of glass-making, the supplies of wood for fuel would soon be exhausted, and in 1615 it was necessary to proclaim that no more wood should be used, but sea coal or pit coal only. About 1616 Sir Robert Mansel bought out several other patentees, and appears to have attempted to monopolise the trade. He must have been a much-worried man. He erected furnaces in London, the isle of Purbeck, at Milford Haven, and on the Trent, all of which failed; at Newcastle-on-Tyne only did he succeed. In 1624 he was specially exempted from the Act of Parliament which forbade monopolies, and he should have been protected by other ordinances which prohibited the importation of foreign glass. But these were evaded; Venetian glass still continued to be brought in, and while he was away at Algiers, the House of Commons declared his patent void. Then his men were bribed to leave him and work in Scotland, and he had to buy up the Scotch works at £250 per annum. When he got his men back again they made such "ill-conditioned" glass that he had

to obtain a whole company from Mantua. Then his clerk absconded and began to send in glass from France, until that was stopped. Altogether, by the year 1634, Sir Robert was £30,000 out of pocket before the manufacture could be perfected, and as soon as he was producing his best looking-glass and spectacle plate-glass at reasonable prices, his men were again leaving him for Scotland, and he was threatened with competition in Ireland. Here this troubled story of a patentee terminates; at the Restoration in 1660 several persons asked for a renewal of Mansel's patent, but apparently without success.

A queer relic of about this time may be seen at the British Museum in a panel of thick green glass from a house at Purfleet; it has the head of Charles II. moulded upon it, and its use is not very apparent. In the Guildhall Museum are several wine bottles and flasks of this period, some having the owners' badges or names applied like seals. In the British Museum are some fragments of seventeenth century common wine bottles found in the bed of the Thames, and glorying in very vivid iridescent colours.

The use of coal for fuel made it necessary to use melting pots closed at the top, and this in turn may have led to the large proportion of oxide of lead that about the time of Mansel's patents came to be used as a constituent of the glass, flint-glass or crystal being the name given to this description. M. Peligot, a French authority on glass, says that "to the English should really be attributed the honour of having created in their flint-glass a new product, which, by the progress made in the quality and selection of the materials used in its fabrication has become, without

dispute, the most beautiful glassy substance which we know, and which it may be possible to produce."

A glimpse of the condition of the industry at the commencement of Charles II.'s reign is obtained in 1664, when the London Company of Glass-sellers (which had apparently had an unofficial existence for many years) on the plea of abuses in the trade for want of proper control, obtained a charter from the king. Grinding, polishing, casing, foyling (foil for backing looking-glasses), and finishing are mentioned, and the patent rights of "Thomas Tilson of London, Merchant," are specially reserved to him for the sole making of crystal glasses, and plate and other glass for mirrors, coach windows, etc. Proud of their new charter, the glass-sellers seem to have offended the City Court of Aldermen by presuming to create a livery without proper licence, and it was not until 1712 that the Company assumed a livery of 60 members. It never seems to have had its full complement, and although still in existence, it is one of the smallest and poorest of the City companies. Of the older association of Glaziers, we shall speak when we come to deal with the subject of windows.

About the year 1673 flint-glass plates for looking-glasses and coach windows were being made at Lambeth by Venetian workmen under the patronage of the Duke of Buckingham. They were visited some four years later by Evelyn, who wrote: "We also saw the Duke of Buckingham's glass-works, where they make huge vases of metall as cleare, ponderous, and thick as chrystal; also looking-glasses far larger and better than any that come from

Venice.”* There would also appear to have been an independent colony at Greenwich, for Evelyn elsewhere records (in 1673): “Thence to the Italian glass-houses at Greenwich, where glass was blown of finer metal than that of Murano at Venice.” The Lambeth-made mirrors are not infrequently met with in old houses; possibly some of the elaborately bordered and bevelled pier glasses still in Hampton Court Palace came from Lambeth.

Evelyn mentions the flint-glass again on the 10th of February, 1685, when, after King James's titles had been proclaimed by the sheriff at Bromley, to the “many shouts of the people, His Majesty's health being drunk in a flint glasse of a yard long, by the sheriff, commander, officers, and cheife gentlemen, they all dispers'd.”

The cruel Revocation of the Edict of Nantes in 1685 had the effect of driving thousands of artisans out of France to seek a shelter on these friendly shores, and among them were many glass-workers. Their arrival made a great difference in the amount and quality of the wares produced; in fact, as Mr. Pellatt has pointed out, it is clear that the influx of the Huguenots must have almost revolutionised the industry. Most of the technical terms used in glass-making betoken a French origin. “Thus, the ‘found’ is the melting of the materials into glass, from the French word *fondre*. The ‘siege’ is the place or seat in which the crucible stands. The ‘kinney’ is the corner of the furnace, probably from *coin* or

* These works continued under the firm of Dawson, Bowles & Co. until 1780, when disputes about wages occurred and the whole business was stopped. The glass-houses occupied the site of Vauxhall Square now almost obliterated by the railway.

cheminée. The 'journey,' denoting the time of making glass from the beginning of the 'found' is obviously from *journée*. The 'foushart,' or fork used to move the sheet of glass into the annealing-kiln, is from *fourchette*. The 'marmore' is the slab, formerly of marble, but now of iron, on which the ball of hot glass is rolled. And so on with 'cullet' (*coule*—glass run off, or broken glass), 'pontil' (*pointée*); and other words obviously of French and Flemish origin." An Abraham Thavenart is mentioned as establishing in England soon after the Revocation some works for the making of plate-glass for mirrors. The name is very like that of the syndicate of 1688 already mentioned when speaking of French plate-glass.

The *Tatler* in August, 1710, has a reference to the Whitefriars' Glass-works now carried on by Messrs. Powell, and originally started about 1700: "At the flint-glass house in White Fryars near the Temple are made and sold by wholesale or retale all sorts of Decanthers, drinking glasses, Crewits, etc., or glasses made to any pattern of the best flint at 12d. per Pound."

During last century the Bristol glass had some reputation. It was chiefly of a white opaque body, decorated in enamels in the style of the white salt-glazed ware or the earliest English porcelain, and has the somewhat limited range of effect and poorness of design that characterised the enamel painting of the period. Pieces of it may be seen in the Geological Museum and in South Kensington Museum. In the Schreiber collection at the latter museum are some pretty little objects in transparent glass of about the same period: bodkin cases, scent bottles, patch-boxes,

and similar trifles. Most of these are in transparent coloured glass—blue, purple or ruby; sometimes cut, the greater number gilded and enamelled in little patternings. At the Geological Museum is a piece in dark green transparent glass made at Nailsea, with splashes of opaque milk-white in it.

The era of cut glass seems to have had no definite beginning. There were early symptoms of the fashion towards the close of the seventeenth century; during the eighteenth, it was ripening; at the commencement of this century cut glass was rampant. The heavier the make, the more handsome the piece was considered; great masses of heavy flint glass cut into sharp aggressive angles and knobs and bosses were thought to be the acme of taste and beauty. Do we not all know the enormous cut glass ornaments of the early Victorian sideboard, the jingling trophies of lustres hung from some strange perpetration of cut and faceted ruby glass, and all protected from the air by an enormous dome of glass—a shade it is called? The culmination of cut glass ingenuity was reached in the enormous glittering pendant called a theatre lustre, which has to be suspended by strong chains through a hole in the ceiling, and which one sits under with fear and trembling lest the whole thing should come shattering down into the stalls. Hardly less ingenious, and much more difficult to make, was the glass fountain of the 1851 Exhibition, in Hyde Park. (It is now at the Crystal Palace, Sydenham.) One reads without much sympathy that the greatest difficulties had to be overcome in constructing this glittering marvel. The casting of such large sections of glass was extremely hazardous, and the waste in spoiled pieces considerable. The

annealing—lasting six or seven days—and the subsequent grinding and cutting filled everyone concerned with the greatest anxiety. There were four tons of crystal glass and three of flint used, in its construction, the principal dish measuring eight feet across, and weighing, before cutting, nearly a ton. Very few people of taste then seemed to consider that after all a shape that could be blown was perhaps the most suitable for vessels both for domestic use and for ornamental purposes, and that this extremely clever cutting might be overdone. But alas, a further ingenuity was possible. The manufacturer said to himself, "The great public wants to have cut glass; it is costly and difficult to make; it takes long to do and skilled men to do it. I will make a model of a piece, with plenty of cutting upon it. I will mould this, and press out hundreds of pieces like it, and there you are! Cut glass, cheap and . . ." Let us record sadly that *pressed glass* is an American invention.

But we are beginning to see now that the ordinary operations of glass-blowing can produce forms of simple beauty and appropriateness, and our manufacturers are finding some encouragement in turning once more to blown glass for their best effects. With some of our makers flint glass itself is given up as being altogether too colourless and cold, with a brilliance too hard and glittering. To obtain softer effects they resort to the lighter glass made with soda and lime. In this, although there is a slight colouration, the limpid quality of the material is very pleasant. Messrs. Powell & Son, of Whitefriars, are now relying very largely on the soda-lime glass for their better table wares, and extremely beautiful it is,

and so delightfully simple in form and finish. The "Clutha" glass made by Couper & Sons, of Glasgow, while not pretending to such high finish, is full of character and quaintness, and the little specks, and bubbles, and general colour all tend to render the shape visible. By no means let us be understood to plead for imperfections. At the same time, in the attempt to gain mechanical perfection, too often the art vanishes. An artist is very often happier when



GLASS-MAKERS AT WORK, WHITEFRIARS.

he is allowing for and utilising the apparent defects in his materials than when, hampered by their very perfectness, he essays some superlatively faultless and conscientiously correct masterpiece.

Whatever William Morris had to say on decorative art is worth listening to. His influence will not soon die, for if there has been a renaissance in recent years in the arts of design, not only of England but abroad, it has been largely due to Morris and those who have

worked with him. In his lecture on the "Lesser Arts of Life," he says:—

"Now as to the art of making glass vessels. It is on much the same footing as the potter's craft. Never till our own day has an ugly or stupid glass vessel been made ; and no wonder, considering the capabilities of the art. In the hands of a good workman the



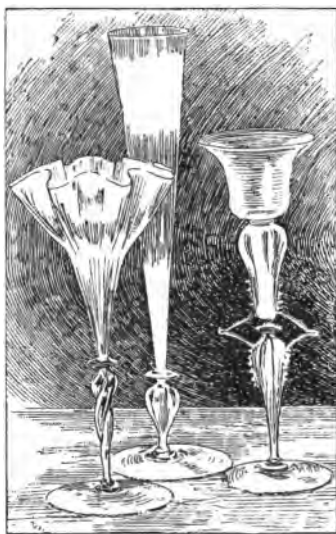
GLASS-MAKERS AT WORK, WHITEFRIARS.

metal is positively alive, and is, you may say, coaxing him to make something pretty. Nothing but commercial enterprise capturing an unlucky man and setting him down in the glass-maker's chair with his patterns beside him (which I should think must generally have been originally designed by a landscape gardener)—nothing but this kind of thing could

turn out ugly glasses. . . . In speaking of glass-work, it is a matter of course that I am only thinking of that which is blown and worked by hand ; moulded and cut glass may have commercial, but can't have artistic value. As to the material of the glass vessels, that is a very important point. Modern managers have worked very hard to get their glass colourless ; it does not seem to me that they have quite succeeded.

I should say that their glass was cold, and bluish in colour ; but whether or not, their aim was wrong. A slight tint is an advantage in the metal, so are slight specks and streaks, for these things make the form visible. The modern managers of glass-works have taken enormous pains to get rid of all colour in their glass ; to get it so that when worked into a vessel it shall not show any slightest speck or streak ; in fact,

they have toiled to take all character out of the metal, and have succeeded ; and this in spite of the universal admiration for the Venice glass of the seventeenth century, which is both specked and streaky, and has visible colour in it. This glass of Venice or Murano is most delicate in its form, and was certainly meant quite as much for ornament as use ; so you may be



VASES BY MESSRS. POWELL.

sure that if the makers of it had seen any necessity for getting more mechanical perfection in their metal they would have tried for it and got it; but like all true artists, they were contented when they had a material that served the purpose of their special craft, and would not weary themselves in seeking after what they did not want. And I feel sure that if they had been making glass for ordinary table use at a low price, and which ran more risks of breakage, as they would have had to fashion their vessels thicker and less daintily, they would have been contented with a rougher metal than that which they used. Such a manufacture yet remains to be set on foot, and I very much wish it could be done; only it must be a *manufacture*; must be done by hand, and not by machine, human or otherwise."

One or two sentences in the foregoing are calculated to make the hair of the average glass-maker stand on end, and to excite his forcible comment. Allowing, however, for Morris's characteristic energy of expression, one has no difficulty in seeing the reasonableness of his contention in this as in all his sayings, that to produce beautiful things, the maker must himself be an artist, a free craftsman pleased with his work.

As in Venice the secrets of the old Venetian and Roman glass were one by one re-discovered and the processes revived, so in this country there has been a successful endeavour to equal or excel the best work of past ages. Several names of manufacturers are honourably mentioned in the histories of the art. Messrs. Bacchus & Sons of Birmingham were among the first to revive the Murano twisted and filigree work. The first canary-coloured glass is also said

to have been made by them on the discovery of the peculiar colouring properties of uranium. Messrs. Green of London, Copeland, Naylor, and Pellatt & Company, Messrs. Osler of Birmingham, Messrs. Richardson and Messrs. Webb & Sons of Stourbridge, have all been noted for various excellences of workmanship. Mr. Apsley Pellatt's work on "The Curiosities of Glass-making" was published in 1849, and is often referred to by writers on the subject.

In Scotland, the first glass was made at Wemyss during the reign of James VI., and possibly by some of the Flemish refugees. There was plenty of scope for their efforts. Glass at that time was so scarce that a window of glass was a rarity. At Alnwick Castle it is recorded that when the Duke of Northumberland was away, the steward was accustomed to take out the glazed windows and hide them away till the owner returned. Even in the middle of the seventeenth century only the principal apartments of the royal palace had glass. Earlier in that century there were the works with which Sir Robert Mansel was connected. About 1620, John Maria Dell'Acqua, of Venice, is spoken of as master of the Scotch works. About 1680, glass was being manufactured at Leith. By the end of the century, the industry was evidently important enough to be endowed with a monopoly. The Newcastle glass-makers having landed at Montrose no less than 2600 dozen of bottles, the Lords of the Scottish Privy Council empowered the Leith Glass Company to seize all such English wares and bring them in for his majesty's use.

During the eighteenth century the trade seems to have fluctuated considerably. A writer in an Edin-

burgh journal of 1792 says that thirty years before there was only one glass company in Scotland, the hands working for half the year in Glasgow and the other half at Leith. They were then making only bottles of coarse green glass. About 1790, it appears that crown glass for windows, cut glass, and gems were being made by the Glass House Company, and several other works at Leith and elsewhere were in operation. The Glass House Company had its own armed ships, so harassed were our coasts at that time by French privateers; one of them, the *Phoenix*, had the reputation of being one of the swiftest sailers in Leith, and was always advertised to sail with or without convoy *as she fought her own way*. There were difficulties, certainly, in those days in the way of commercial transactions. A record of the Jacobite times may be seen in the Schreiber Collection at South Kensington, in the goblets engraved with a rose and two rosebuds, emblematic of James II. and the Old and Young Pretenders, or with a portrait of Prince Charlie in tartan dress. These must be Scotch work of the last century.

A special kind of work that ought to be mentioned is the manufacture of artificial gems as revived by James Tassie at the end of the last century. A native of Pollokshaws, near Glasgow, he, like many another Scotch artist, moved to London, and acquiring a reputation for his skill in imitating in glass all kinds of cameo and intaglio antique gems, was offered such facilities by the owners of them as to be able to form a collection of upwards of 15,000. More important, however, than these copies were his original portraits in cameo of famous contemporaries, and these are now eagerly sought for by collectors.

We must mention now, but very briefly, the efforts that have been made in recent years in England to revive the art of glass mosaic. As already mentioned, the Venetian firm of Salviati was for a certain period of the Gothic revival entrusted with the making of numerous panels of mosaic for our cathedrals and churches. The designs may have been—generally were—supplied by English artists, but the work was done at Venice and sent here to be fixed. On the upper walls of the South Court in South Kensington Museum there is an interesting series of mosaic panels representing famous artists of old and modern times. The panels are plainly in several different styles, of which those executed in ceramic mosaic need not be detailed here. Of those in glass mosaic, several were done by Salviati; these were "Pisano," designed by Lord Leighton, "Giorgione," by Prinsep, and "Fra G. D'Ulma," by Westlake. Sir E. J. Poynter's two panels of "Phidias" and "Apelles," and one of "Della Robbia" by Moody, were made by Harland, Fisher & Company. The panel of "Inigo Jones," designed by A. Morgan, was executed by Simpson & Sons, and one of "Palissy," designed by Townroe, by Mr. Jesse Rust. The gold grounds are worth noticing; those in the Salviati panels are almost too well done, they are so perfect and flat as to be like a continuous sheet of glass against which the figure looks cut out and dark. This flatness is such as might arise from the mosaic being worked upside down upon a level bed, the plan usually adopted where the mosaics are executed in a workshop, and not direct upon the wall. Mr. Rust, who was responsible for one of the panels, had several important works in hand about

that time,* and while primarily a maker of ordinary blown glass, was devoting a good deal of time and trouble to the manufacture of a glass mosaic for floors. This material—coarse and granular in composition but very effective in colour and, of course, extremely durable—was used, among other places, in some of the courts of South Kensington Museum.

The present president of the Royal Academy has interested himself in mosaic work on more than one occasion. One of his earliest designs was for a panel in the Houses of Parliament, the subject being St. George of England with accompanying figures of Fortitude and Purity. It was contemplated that other panels in the lobby should be similarly treated, but this was the only one actually carried out. The cartoon hangs in South Kensington Museum. Following upon this, the authorities at South Kensington sent him to Venice to study the mosaics at St. Mark's, with a view to his preparing a design for the decoration of the half-dome over the Lecture Theatre. The design was duly made, and there the matter ended. The dome still shows an expanse of cement, and the design, painted upon a model made to scale, may be seen in the museum. It is very elaborate, and comprises numerous figures of great artists and men of science, figures of the Muses, Truth, and Beauty, etc. Why was the scheme never carried out? At a later date, Sir E. J. Poynter was consulted about the decoration of St. Paul's Cathedral, and prepared

* Among others, some small panels over the altar at Westminster Abbey. The present writer may be pardoned for mentioning that, as a small boy, he helped to put some of the tesserae in place, and remembers still the weird effect of working on into the dusk while listening to the choir at practice away down the darkened church.

designs for certain parts. The great opportunity of decorating Wren's masterpiece has now fallen, however, to the hands of Sir W. B. Richmond, R.A., who, in selecting glass mosaic as the medium, made by an English maker, and fixed by English mosaic workers, has inaugurated a monumental work of truly national importance. The eight spandrels under the "Whispering Gallery" had already been filled with mosaics executed by Salviati. Four of these representing the Four Greater Prophets, from designs by Alfred Stevens, the designer of the famous Wellington Monument, were done many years ago; the other four of the Evangelists (two designed by G. F. Watts, R.A., and two by W. F. Britten), comparatively recently. Their effect is rather disappointing; their smoothness of execution has robbed them of all life and brilliancy, and they look dull compared with the more gorgeous work that may now be seen within the choir.

Devoting the greater part of his time and attention to the task, Sir W. B. Richmond has, since 1891, been almost continuously engaged in designing and superintending the filling of the panels left by Wren in the interior design of the choir and apse of the cathedral. A study of the old Italian mosaics, and especially those of Ravenna, had convinced him that their manner of execution was the best, and that the smooth modern work was a mistake. After making one or two trials in his own studio upon panels which were afterwards fixed up bodily, he came to the conclusion that the work must be done direct upon the prepared surfaces of walls and domes—a much more difficult way of course, but one that permitted him to gauge the effect as the work went on. By this means, he eventually found it possible, and indeed advisable, to

simplify both designs and workmanship, and while the portions first finished can hardly be distinguished owing to the smallness of the details, and the confused blur of the numerous shades of colour used, the later work is much bolder in scale, and more vivid and brilliant in colour, using not many more than fifty tints as against one hundred and fifty at the first. All the tesserae are set in very roughly as regards level, so that the light sparkles from their varying facets. The glass is made by Messrs. Powell of Whitefriars, and up to Easter 1896, over ten tons weight had been used, cut up into millions of tesserae set into something like twelve tons of mastic cement. In the domes, this cement adheres to the original brickwork, the old plaster covering being removed; where the new mosaic is laid on the stonework, this has had to be cut out to a depth of three-quarters of an inch, so that the finished surface gives the same plane as before. No change has been made in the mouldings and rather heavy carvings left by Sir Christopher Wren, although their forms somewhat hampered Sir W. B. Richmond. Their harsh effect has, however, been softened by judicious painting over in encaustic colours, and there is now a general harmony between architecture and decoration. This is certainly a milder solution of the difficulty than that suggested by the late William Burges, who, when preparing designs some twenty years ago, was of opinion that the proper way to decorate St. Paul's was to strip off all the mouldings inside, and cover the whole surface with gold mosaic, in the style of St. Mark's at Venice. That St. Paul's is not Byzantine in architecture, it is hardly necessary to observe, and Burges's idea was of course impracticable.

It may be interesting to note the general plan of the subjects selected for the St. Paul's mosaics, and then we must leave this fascinating subject. As with so many of the Roman basilicas, the dominant figure is that of our Lord in Majesty, which fills the centre panel of the apse, and is visible to the extreme end of the church. In the panels to right and left are the Recording Angels of the Judgment. In the windows which break into these spaces, and which have been filled with new glass of extremely fine colour, are represented the Four-and-twenty Elders, with the Archangel Michael and other angels. To right and left of the apse are panels of Noah's Sacrifice, and Melchizedek blessing Abram. In the main arcades of the choir, and going from west to east, the spandrels have the Creation, the Expulsion from Paradise, the Annunciation, Adam and Eve in Paradise, and angels bearing the instruments of the Passion. In the panels of the attic order over the north and south halves of the organ are two of the most brilliant pieces of colour in the cathedral. They represent Adam in the garden of Eden with a lion and lioness, and Eve with tigers and peacocks. Lest any should say that these representations of the "human form divine" are inadmissible upon the walls of a sacred edifice, however dignified and reverent the treatment (as here), one might argue that if created things may be depicted at all, the noblest work of the Creation ought to find a place, and that if it is permissible to represent the circumstances of the Redemption of man, it should also be possible to suggest the need of it as symbolised by the Fall of our first parents.

The smaller panels to the eastward of those last mentioned are filled with ornamental arrangements of

beasts, fishes, and birds, and at the extreme east adjoining the apse, the subject of the Sea giving up its Dead. The spaces in the clerestory on either side of the windows are filled with figure subjects. On the north side these represent the "ancient world looking forward to the Coming of Christ," as suggested by Abraham, Job, Cyrus, Alexander the Great, the Persian and the Delphic Sibyls. On the south side are "the earliest visions of the House of God" in figures of Jacob, Moses, Bezaleel, Aholiab, Solomon, and David. The pendentives or triangular spaces between the main ribs of the vault, are each filled by a huge angel with extended arms, and the three saucer-shaped domes with representations of the creation of beasts, fishes, and birds. The design of these is remarkably ingenious, and one would like to see them from a nearer standpoint than the floor.

The general effect of this great scheme of decoration is remarkably rich, and it is to be hoped that the Dean and Chapter, now that a grand commencement has been made, will be enabled to utilise the services of Sir W. B. Richmond in clothing with beauty the vacant spaces of the rest of the cathedral. Thus eventually there may be realised Wren's own idea, as recorded by his grandson: "The judgment of the surveyor" (Wren's official title) "was originally, instead of painting in the manner it is now performed, to have beautified the inside of the cupola with the more durable ornament of Mosaick work, as is nobly executed in the cupola of St. Peter's, in Rome, which strikes the eye of the beholder with a most magnificent and splendid appearance, and which, without the least decay of colours, is as lasting as marble or the building itself."

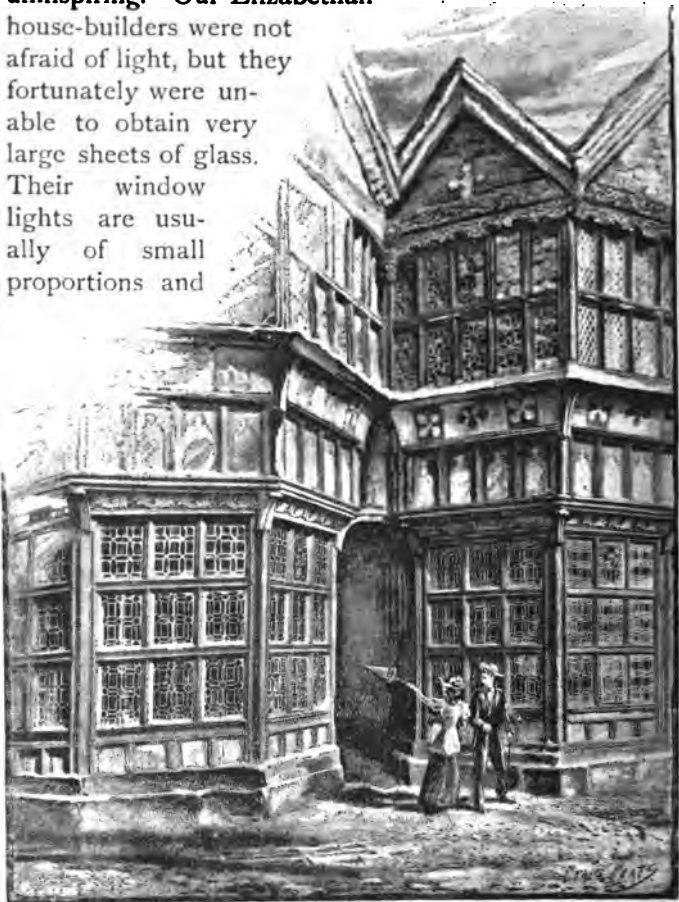
CHAPTER IX.

ART IN THE WINDOW.

THE delightful old English window, with its diamond-shaped panes twinkling in the light as the casement swings open—where may one see it now? Here and there in the country cottage or farmhouse one may find a cobwebbed specimen or so, or in the hall or manor-house a quaint painted quarrie with delicate pencilling in brown or yellow. But for the most part, the yawning hole in the wall, the dreadful vacancy of the sheet of plate-glass, the convenient tameness of the sash window—these have taken away a good deal of the picturesqueness of mediæval times, and we, in our ignorance of what is amiss, are left to solace ourselves with chromo-lithographic transfer sheets, with names as dreadful as their designs, or with “cathedral-tinted” glass of the most excruciating colours.

Could we attain to the simplicity of the old work we should be much happier. A window is not merely a hole in the wall; it is a part of the room, and the bars and lead-lines remind us of the existence of the house walls that shelter us. On the other hand, a great sheet of invisible glass only tempts us to walk through it, floods the room with a glare of light, and

looks as cold and comfortless as it is modern and uninspiring. Our Elizabethan house-builders were not afraid of light, but they fortunately were unable to obtain very large sheets of glass. Their window lights are usually of small proportions and



LITTLE MORETON HALL.

grouped in numbers together, interest being often gained by the patterns formed in "leading up" the

small pieces of glass. In Lancashire and Cheshire many of the old timber-framed houses still retain their original glazing. At Little Moreton Hall, in the latter county, one may read, carved in the solid oak of the unique bay windows:—

GOD IS AL IN AL THING
 THIS WINDOVS WHIRE
 MADE BY WILLIAM MORETON
 IN THE YEARE OF OURE LORDE MDLIX
 RYCHARDE DALE CARPEDER MADE
 THIES WINDOVS BY THE GRAC OF GOD.

A good example of the elaborate planning of windows might have been seen till recently in Bishopsgate Street, where Sir Paul Pindar's house stood until it was removed to make way for the Great Eastern Railway terminus. It was partly re-erected in South Kensington Museum, and as far as the outside goes, can now be studied in quieter surroundings than it had towards the end of its existence in Bishopsgate. But the elaborate plaster work of mantelpiece and ceilings had to be destroyed, and the view of the windows from within can no longer be had.

Now and then one comes across an old window—generally a cellar window—where the panes have been filled with bull's-eyes, "roundels," or the waste centres left from the discs of crown glass after cutting all the possible rectangular pieces from them. The manufacture of crown glass has now practically been given up in favour of sheet glass, and so no more

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bull's eyes are available. But a certain quaintness about them has led in these days of modern antiques to their being asked for once more, and they are now made specially for insertion in "artistic" windows. Bottle ends have been made to serve a similar purpose, and something of the sort may be seen represented in drawings by Albert Durer and other German artists.

The patterns of "leading" were no doubt traditional with the old glaziers, and do not greatly vary throughout the country. The oldest book dealing with the trade was issued by Walter Gedde in 1615, under the title of "A Booke of Syndry Draughtes, Principally serving for Glasiers: And not Impertinent for Plasterers and Gardiners."

In the same year the London Glaziers, who had for many years previously existed as a Fellowship or Guild, were empowered by the Common Council to control all persons using the Art of Glazing within the city and Liberties, and strict rules were laid down for the binding of apprentices to none but "free" glaziers. Formal incorporation did not take place till 1638, although the Craft had sufficient standing in 1627 for the Wardens to be committed to Newgate Prison on account of failing to pay an assessment toward a loan to the Crown. The charter changed the "ancient Fraternity of the Mistery or Art of Glaziers" into a body "corporate and politic by the name of the Wardens and Commonalty of the Mistery or Art of Glaziers and Painters of Glass." The company still exists in the city, but has no hall, and possesses no great wealth.

It was a very usual custom in feudal times for those who possessed coats-of-arms to have them represented

in the windows of their halls. Many of these may still be seen, though doubtless hundreds have disappeared—carelessly lost during alterations to the houses or with changes of ownership. Where intact they are often of great value to the historian, to say nothing of their artistic interest. Bolingbroke, in Shakespeare's "Richard II." addressing his prisoners, says :—

" . . . you have fed upon my signories,
Dispark'd my parks, and fell'd my forest woods ;
From my own windows torn my household coat,
Raz'd out my impress, leaving me no sign,—
Save men's opinions, and my living blood—
To show the world I am a gentleman."

Almost every record of household expenses that has been saved from the Middle Ages will have some items relating to the windows, and they afford quaint reading. At Hampton Court Palace the accounts state that "Galyon Hone the Kynges glasier," in the year 1534, put "in the two great wyndowys at the ends of the haull two great armys, with four beestes in them at 6s. 8d. the pece ; also in the said wyndows in the haull 30 of the Kynges and Quenys armys, pryce the pece, 4s. ; also 46 badges of the Kynges and the Quenys, pryce the pece, 3s. ; also 77 scriptors with the Kynges worde, pryce the pece, 12d."

None of these old "armys" now remain. All the stained glass now in the Great Hall is modern, and was put in by Willement between 1840 and 1846, but the same idea was carried out by him, and the huge windows are once more filled with coats-of-arms, badges, and "beasts" of everyone connected in any way with Henry VIII.

But we must leave these

“ . . . chambers and parlors of a sorte,
With bay windows, goodly as may be thought,
As for daunsing and other wise disport ;
The galleries right well ywrought,”

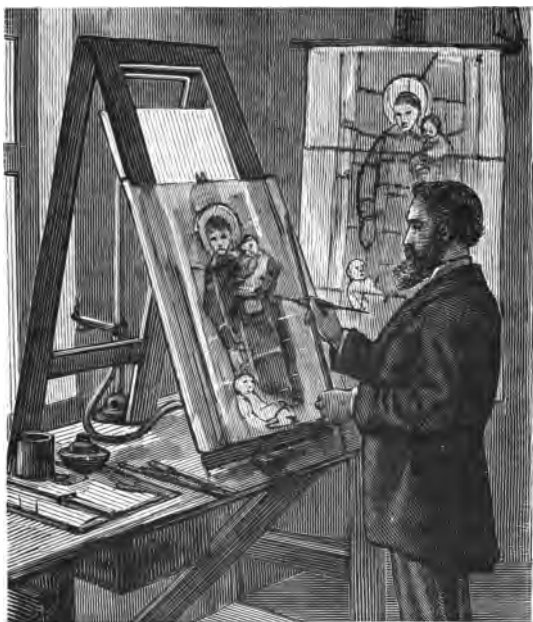
and turn from Chaucer's picture to the other great division of window glass with which we have to deal : the stained or painted glass such as we see in church windows

Here is a subject about which much has been written, and which might have easily filled the whole of our space. We shall, however, only be able to skim the surface, and must refer those who are interested to the numerous works that deal with it in detail.

Decorated glass for windows falls into two main classes, *stained* and *painted*. The earliest coloured windows were mostly of stained glass ; as time went on it became usual to help the effects by painting ; during last century, reliance was almost altogether placed on painting. Most windows now combine both methods. The glass stained or coloured throughout its substance is known as *pot metal*, and a window formed by a mosaic of such glass will be more brilliant than where any painting has been added. Glass painting is executed with opaque enamel colours containing a certain amount of fusible material or flux which is melted by heat and adheres to the surface of the glass, interfering of course more or less with the light passing through. As the purpose of a window is generally to transmit light, the opacity caused by too much enamel painting is clearly out of place.

In building up a window the general method

adopted is to make a tracing from the full size cartoon by the artist. This tracing will have upon it the dividing lines or "lead-lines," which the artist will, of course, have arranged for from the first.



GLASS PAINTER AT WORK.

Designers now, as a rule, are not afraid of the lead-lines; they are an essential condition of the method of construction, and being absolutely indispensable are best worked into the design. At one period of bad art, it was considered correct to do without the lead lines as much as possible, and use the biggest sheets of glass obtainable. Pieces of coloured or plain glass are selected for the spaces indicated by

the tracing, and a glazier cuts them to the exact shapes. Any outlines then required by painting are pencilled on the pieces and fixed by heat in the "first fire." The pieces of glass are next placed in their correct positions upon an easel of glass, lighted from the back, and the shadows and background stain painted on. If any variations of colour are required to represent folds of drapery and so on, some attempt is made when selecting the pieces of glass at first to pick out those with natural markings and veins, but these are very rarely complete or exact enough, and the details have to be painted on. Having been fired once more, the fragments are put together upon the tracing, and leaded up with narrow grooved strips of lead soldered at every crossing, and further solidified by cement rubbed into the grooves. The window is then ready for fixing, requiring only to be stiffened in position by the iron stay bars and cross-bars to which it is attached by loops of stout wire.

As we have said, the lead lines have at one time been considered objectionable. It was thought that they interfered with the pictorial effect of the painting. But there was here a double mistake. First of all, windows should not be pictures, and those artists—the Munich school, for instance—who attempt to make a window look like an oil painting, are attempting an impossibility, and one that would not look well were it successful. And in the second place, as it must be clear to everyone that different colours in glass are obtained by using different pieces and are put together as a kind of mosaic, the joining up ought to be frankly acknowledged. It is so for the most part now; in fact, some extremely conscientious

designers go to the opposite extreme, and entertaining an exaggerated respect for the lead lines make almost too much of them, till you begin to wonder where the glass is.

Stained glass may be described as especially a Gothic art. Its rise and growth coincided with the development of Gothic architecture, and when the latter decayed and died out, the art of stained glass too waned and suffered extinction. The means of painting on glass were not unknown in antiquity, as we have seen, but it does not seem clear that for windows any extensive use of the knowledge was made before the eleventh or twelfth centuries. Then with the change from Norman or Romanesque architecture to the first of the Gothic styles there begins a very characteristic school of window design. Although stiff and angular in drawing, the figures are expressive and tell their story effectively; the colours are few, red and blue being predominant tones. The painting is of the simplest; the outlines are very strong, and sometimes wider than the leads. The figure subjects are arranged in medallions, the spaces between being filled with conventional foliage, built up in small pieces of glass with a kaleidoscopic effect. Some of the windows in Canterbury Cathedral date from early in the thirteenth century. Owing to various regrettable incidents, such as Henry VIII.'s demolition of the Becket relics and at a later period the ravages of "Blue Dick" and other Puritans, the greater part of the old glass at Canterbury has disappeared. Originally the nave windows were filled, and served as a picture-book to the crowds of waiting pilgrims. Chaucer describes them as gaping around and speculating as to the subjects of the pictures.

“‘He beareth a ball-staff,’ quoth the one, ‘and also a rake’s end;’

‘Thou failest,’ quoth the miller, ‘thou hast not well thy mind;

It is a spear, if thou canst see, with a prick set before,
To push adown his enemy, and through the shoulder bore.”

Their surmises are interrupted by the host of the Tabard. “Peace,” he says,

“Let stand the window glazed;
Go up and do your offerings, ye seemeth half amazed.”

In France, the oldest glass of any importance is that in the Abbey of St. Denis, near Paris, where the windows that escaped the havoc of the Revolution have set the pattern for the modern restorations. Abbot Suger’s Church—one of the first to use the pointed arch and vault—was commenced before 1140. The famous windows of Chartres Cathedral date from about 1250, and in them the employment of small figure subjects in medallions is still found, with borders of elaborate ornament. Often the lower part of the window is occupied with a representation of the trade of the workmen’s guild which paid for that particular window. Above, in the clerestory, where no close inspection was possible, large single figures, twenty or thirty feet high, were introduced. At Poitiers, Sens, Rheims, and Bourges, and many other French churches the windows are all of this kind. It was an enthusiastic and fervent age; miracles were daily happening, and in the numerous elaborate churches rich with carving, metal-work, and painted glass, the people left the story of their piety. In the Sainte Chapelle at Paris—not a very large building, but one of such extremely slight

construction that it really seems to be all window—an extraordinary assemblage of designs is found. Over 800 subjects are represented in the huge expanse of glass, comprising between two and three thousand figures. As the interior of the chapel has been enriched with elaborate polychromatic decoration by Viollet-le-Duc, the combined effect of windows and walls is bewildering. A few pieces of this early French work may be seen at South Kensington Museum in the corridor under the Ceramic Gallery, but at such close quarters the somewhat archaic figures do not show to advantage. In fact it is unfair to exhibit them.



WINDOW, LATE GOTHIC.

Church windows should be looked at in church, and not in a museum, torn from their appropriate surroundings.

A development in England towards the end of the thirteenth century brought "grisaille" into use. In these, instead of the strong reds and blues of the earlier work, the greater portion of the window is in white glass, painted with scroll-work, and against this the scantier pieces of colour tell out like jewels. The window at York Cathedral called the "Five Sisters" is a well-known example of this work. During the fourteenth century, the figures were placed under elaborate painted canopies, a great feature being made of the contrast between the plain canopy and border, and the rich colour of the figures. At York Cathedral and at Merton College Chapel at Oxford there are good examples of this style, which, according to William Morris and other writers, was the highest point reached by the art. Of the great east window at York, with its hundred subjects, we are told that it was the work of John Thornton, master-glazier of Coventry, and that he was paid for it at the rate of four shillings per week for three years besides one hundred shillings at the end of each year, and, if the Dean and Chapter approved the work, a final ten pounds in addition. With the glass of the Perpendicular Gothic of the fifteenth century a more elaborate technique is found. Stipple shading is much used, and with less colour and paler tints, the general effect is described as silvery and refined. The yellow stain, first used in the preceding century, is now extensively employed, some beautiful windows being composed almost entirely of whites and yellow. As examples of English glass of this period, we may mention the windows in the ante-chapel of New College, Oxford,

dating from about 1380, the huge east window at Gloucester Cathedral, and several beautiful windows in Malvern Priory. One of these latter, said to have been the gift of Henry VII., has an inscription asking for prayers for the "good estate," not only of the donor and his queen, but also of Prince Arthur and his wife. As the prince, a boy of fourteen, died in 1502, having been married only five months, the date of the window is clearly fixed.

A favourite "motive" for a church window during all these periods was the genealogical exercise called a "Jesse Window." From a reclining figure of Jesse at the bottom of the window, a huge vine was made to grow, enclosing at intervals panels for other figures in the line of descent of our Lord. One or two quaint examples have the stonework of the window carved in the form of the tree with wandering branches, and the figures in glass occupy the openings.

Abroad, during the fourteenth century, French glass was very similar to English in its combination of grisaille with colour. At St. Ouen in Rouen, at Troyes, Evreux and Poitiers are famous examples. In Germany, somewhat bolder designs and stronger colours are found. At Strasburg, Cologne, Ratisbon, and Nuremburg, there are windows of especial beauty. A not unusual arrangement in German windows was to mass all the rich colour at the bottom, and put the lighter or white glass at the top. This does not produce so well-balanced an effect as where in English work the colour is taken across the window in bands separated by spaces of light canopy work.

With the sixteenth century and the approach of the Renaissance, glass-painting came to be much heavier in style and less good in colour, and the attempt to

be pictorial, with proper perspective and light and shade, led to the overloading of the glass with pigment, so that all translucency was lost. The glass had ceased to be window-glass, and had not succeeded in becoming a picture. Some of the transitional work, in France especially, is interesting and suggestive, Gothic and Renaissance details occurring side by side. At St. Etienne and St. Gervais in Paris, at Auch and Beauvais, and in several of the Rouen churches, the work is at its best. Among the artists we read of are Jean Cousin, Demole, Enguerand, and the potter Palissy. To Palissy are attributed some charming grisaille windows with the story of "Cupid and Psyche," formerly in the Chateau of Ecouen, and now in the chapel at Chantilly.

Contemporary with these in France, the glass-painters of the Low Countries were going still further in the direction of heavy shadows and pictorial effects. The light Gothic canopies gave place to immense architectural compositions drawn with extreme ingenuity, but so strongly painted as to contend with the figures in importance. Bernard Van Orley, the greatest artist of his time, and the designer of the "Abraham" tapestries at Hampton Court Palace, was responsible for much of the Flemish work. In the cathedral at Brussels there are some important windows by him, with portrait figures of various royal personages, the donors of the glass. The main note of the design is the shading of the figures so that they stand out as darks against a pale blue background. At Gouda in Holland, the church contains a remarkable set of windows dating from about 1560 and most of them painted by two brothers, Wouter and Dirk Crabeth. The original coloured drawings happen to be pre-

served in the sacristy. In these windows, the admirer of Gothic glass can see nothing but abomination. They are designed as pictures solely, and are altogether inappropriate to their material.

Some examples of Flemish glass are found in England at Lichfield and Southwell. There is a tradition that Holbein designed the glass at King's College, Cambridge, but the names of the workmen are certainly English, and the style is not unmitigatedly Flemish. The east window at St. Margaret's, Westminster, has had a somewhat romantic history. It is Flemish work, and seems to have been painted at Dordrecht, having been, so it is said, ordered by Ferdinand and Isabella of Spain when their daughter Catherine was affianced to Arthur, Prince of Wales. It may have been intended as a present to Henry VII., and, according to another account, it was the magistrates of Dordrecht who were going to present it. But Henry VII. died, and the window came into the hands of the Abbot of Waltham. At the Dissolution of Monasteries it was sent to New Hall, and in time was acquired with that property by General Monk. Buried for safety during the Puritan Commonwealth, the loyal general replaced it in his chapel at the Restoration. There it remained till 1738, when John Olmins, having purchased the house, offered the window—"one of the finest large windows of painted glass in England," as he calls it—to Dr. Swinton of Wadham College. The College did not want it, and it remained cased up for some years. Then a Mr. Conyers of Copt Hall, Epping, bought it for fifty guineas, and put it up in his house. His son took it down again and, for 400 guineas, sold it in 1758 to the committee for repairing and beautifying

St. Margaret's. It was fixed in the church, and so ended its wanderings, not far away from the resting-place of the monarch for whom it had been intended two hundred and fifty years before. Even then its troubles were not over. Offended at the representation of the Crucifixion which occupies the main portion of the window, the Registrar to the Dean and Chapter brought an action against the churchwardens "for that they had set it up without a faculty, and that it contained superstitious images." The suit lasted *seven* years, and in the end neither side won. But the "superstitious image" was allowed to remain, and the churchwardens, to commemorate the failure of the attack, gave to the church a richly-chased silver-gilt cup, which is still produced with ceremony at parish feasts.

It is hard to believe that a great many old Gothic windows were destroyed to make room for the Renaissance glass. It was, however, the case at many and many an English church. At Oxford Cathedral for instance, about 1630, Dean Duppa, a man of classical tendencies and author of a life of Michael Angelo, almost succeeded in removing all Gothic features from the building. He pulled down the stalls, broke up the monuments as "old superstitious stuff and unhandsome to be mixed with the new pavement," and altered all the window-tracery. The aisle-windows he "beautified with glass, admirably well performed by the exquisite hand of Abraham Ling, a Dutchman, an. 1634." The priceless old glass, with pictures of St. Frideswide the patron saint, was destroyed. In their turn, Ling's windows, with one exception, were turned out about twenty-five years ago, as they made the church too dark. In the one

remaining Jonah is depicted sitting under his gourd, with the town of Nineveh represented Durer-wise in the background.

If cultured men such as this dean could see so little to admire in Gothic work, and have so little reverence for the work of bygone artists, it is not surprising that other more ordinary folk should feel no compunction in removing the old glass from many and many a sacred edifice. What escaped demolition at the Reformation incurred great damage at the hands of the Puritans, and the few examples that survived the Civil Wars mostly disappeared during the far from enlightened eighteenth century. Here is a letter that explains why Salisbury Cathedral appears so cold and bare. It was written in 1788 (during Wyatt's so-called Restoration) by John Berry, glazier, of Salisbury, to Mr. Lloyd, of Conduit Street, London :—

“Sir,—This day I have sent you a Box full of old Stained and Painted glass, as you desired me to doe, wich I hope will sute your Purpos, it his the best that I can get at Present. But I expet to Beatt to Peceais a great deale verely sune, as it his of now use to we, and we Due it for the lead, if you want eney more of the same sorts you may have what thear his, if it will pay for taking out, as it is a Deal of Truble to what Beating it to Peceais his, you will send me a line as sune as Possoble, for we are goain to move ore glasing shop to a Nother Plase, and thin we hope to save a greatt Deale more of the like sort, which I ham your most Omble Servnt—John Berry.”

So little was stained glass understood a hundred years ago that when Sir Joshua Reynolds was asked to design a window for New College Chapel, Oxford, he prepared a cartoon such as would have been

suitable for an oil painting. Transferred to large square panes of clear glass and painted in thick enamel colours by Mr. Jervais with an entire absence of luminosity, even Sir Joshua himself did not like the result.

With the Gothic revival of the early part of this century the art of glass-painting has been once more brought into effective use. At first, the designers somewhat timidly relied upon precedent, and produced those numerous copies of angular mediæval saints which now we would gladly see consigned to oblivion. We want a second Gothic revival to get rid of the mistakes of the first. But the efforts of our glass-makers and artists—Madox Brown, Morris, Burne-Jones, Selwyn Image, Henry Holiday, C. E. Kempe, Richmond, Westlake, Christopher Whall, and many others (to speak of English designers only)—are bringing a colour and charm into our windows that rival the glories of the past. Simplicity of method, sincerity of design, honest workmanship—these virtues characterised the masterpieces of old times, and ever seeking these rather than cheap unending prettiness, the clever craftsman of to-day may still bring his message of beauty into the lives of those around him. There is room for originality; the last word in the art of glass-making has not by any means been said. But whether it is a new song, or an old one resung, provided that the voice be but true, the world will listen eagerly to any melody that has beauty for its theme.

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